





## Transactions of Scientific Bodies.

## MEETINGS DURING THE ENSUING WEEK.

THIS DAY	Royal Botanic—Inner Circle, Regent's-park	3 P.M.
MONDAY	Geographical—2, Waterloo-place	8 P.M.
	Medical—Bolt-court, Fleet-street	8 P.M.
TUESDAY	Medical and Chirurgical—33, Berners-street	8 P.M.
	Civil Engineers—25, Great George-street	8 P.M.
	Zoological—11, Hanover-square	9 P.M.
WEDNESDAY	Bye-Egyptian—71, Mortimer-street, Cavendish-square	7 P.M.
	Graphic—Thatched-house Tavern	8 P.M.
	Pharmaceutical—17, Bloomsbury-square	8 P.M.
	Ethnological—17, Saville-row	8 P.M.
THURSDAY	Literary Fund—73, Great Russell-street	3 P.M.
	Royal—Somerset-house	8 P.M.
	Antiquaries—Somerset-house	8 P.M.
	Royal Society of Literature—4, St. Martin's-place	4 P.M.
	Medico-Botanical—32, Sackville-street	8 P.M.
FRIDAY	Astronomical—Somerset-house	8 P.M.
	Royal Institution—Albemarle-street	8 P.M.
	Philosophical—42, St. James's-square	8 P.M.
SATURDAY	Asiatic—14, Grafton-street	2 P.M.
	Westminster Medical—17, Saville-row	8 P.M.

## On Mining, &amp; the Practical Applications of Geological Science.

## PROFESSOR ANSTED'S LECTURES AT KING'S COLLEGE.

## LECTURE XIX.—MINING FOR METALS CONTINUED—DISCOVERY OF VEINS FURTHER CONSIDERED—VALUE OF OLD MINING PROPERTY—CIRCUMSTANCES UNDER WHICH IT IS VALUABLE OR OTHERWISE—THE OLD MINERS—THEIR MEANS AND DEGREE OF KNOWLEDGE, &amp;c.

Professor ANSTED said, that in his last lecture he had directed attention to the various means which presented themselves for the discovery of mineral veins—not only in countries where it was known that they existed, but in others which were untried. These means involved an idea of the circumstances under which they existed, the character of the ground in which they were likely to appear, the nature of the associated minerals, the veinstone, or gangue, the walls of the veins, and the materials associated with the metalliferous ores, distinct from the vein itself. Among these indications, there was, however, one which he had omitted to mention, and that was in reference to gossan, which usually consisted, to a considerable extent, of oxide of iron, and formed the decomposed outer surface of the ore, or lining substance in the vein. This, in a clay-slate country, was an indication of considerable importance, though such a result did not invariably follow. He wished to remind them, that gossan was, after all, a local phenomenon, and was not found in many parts of the world. Gossan in a granite as well as in a slate country was often an indication of lodes.

He had also spoken of the recovery of veins by calculation, or actual search, when twinned, or nipped in, or when shifted by faults, or heaved, as it was called in Cornwall—the veins being moved by something in the nature of a fault, and their continuation being concealed by intervening substances.

He came next to the working of old mines, and the recovery of mining property which had been long neglected. In all mining districts, there were vast numbers of old workings, of which little that could be depended upon was known. These were very often put forward as promising investments for money, and as likely to yield great results. The parties wishing to dispose of such property, naturally referred to the history (if it had one) of the mine, and of the traditions respecting it, so as to make it appear a promising speculation. Of course, it was very important in such cases to know what the real probabilities were, in order to give a sound opinion of the value of such neglected mines, and whether they might or might not be worth re-opening.

Now, it was to be remarked, that of these mines there were, no doubt, many which were fairly worked out. These cases might seem simple enough, but they were not so in reality, as it was often quite impossible to tell whether a certain mine was thus exhausted or not. It was not likely, however, that persons would risk their money for the purpose of making the necessary researches, without some very good reason, as the expense of clearing up old mines was very considerable. Very little accurate information could, however, be obtained without this being done; but still much might be determined with regard to probabilities. In looking at the value of property consisting of old mines, the first thing to consider was the probable reason for which they had been stopped. If, from the appearances in the neighbourhood, the mine was not a mere attempt in search of mineral produce which, on being unsuccessful, had been abandoned, but a really productive work to some extent, which had at last been neglected, an attempt must be made to discover why it had been thus left.

It was not uncommon that this was the mere result of the vein being exhausted, though, of course, those who had the property were not likely to admit it. It was the usual practice to give the history of a mine, and leave the purchaser to judge of the value of what remained. This, however, it was not easy to do, for the old shafts and levels would mostly be choked up with rubbish, or drowned out with water; and until the one was removed, and the other pumped away, it would not be possible to tell the true state of the case. Mines were often neglected for this best of all possible reasons—that they ceased to yield anything; but it was, no doubt, possible, that "the old men," as the original workers were called, had been at a loss, in consequence of their ignorance of the true theory of mineral veins; and it was also possible, that there might have been a want of perseverance on their part, in looking for the vein after it had apparently terminated.

The general condition of the veins in the districts might also not be sufficiently known to indicate to the old people the direction in which they should go after the vein was lost. Suppose a rich vein were twinned in at the bottom, it was now known that it would, in all probability, continue rich when it re-appeared; and if the old people had ceased working, in consequence of the purpose of finding the vein in the deep. This would happen occasionally, and, possibly, the richest part of the vein might be found below. In such cases it became a question, whether it would be best to take advantage of the work done before, or to sink again in a more convenient place. It was also possible that the old people had lost the vein by a heave, and had not known where to look for it. This might seem a very probable circumstance, but if the vein paid the expenses of working, and yielded a good profit, the old people rarely abandoned a mine without a strict search—indeed, he had seen cases in which they had gone on for 100 fms. in a wrong direction through dead ground, because they knew that veins lost were often found again by strict and careful search. It was not uncommon, in cases of this kind, that instead of being at the trouble and labour of removing the rubbish thus produced, it had been disposed of by filling up old levels; and, therefore, until all this was removed, the actual state of the lode could not be seen. The expense of such a removal was sometimes heavy, and often very unsatisfactory. It was also likely that many levels were driven for the purposes of drainage only, and without any idea of catching the vein again. Such researches would not, of course, be likely to pay, and the best and cheapest plan would be, in such cases, to seek the vein itself elsewhere, according to the principles of modern mining. Want of perseverance was seldom a fault in old miners, labour and timber both being much cheaper than they now were, and our ancestors more patient, and more willing to run risks, because they could do so with a smaller capital than would now be requisite. Their great expenditure was in labour rather than in capital; and there were cases, particularly in Germany, where upwards of 1000 fathoms had been driven through a country of the hardest granite, with scarcely the remotest chance of success. Want of knowledge was generally made up by perseverance, and it was not, therefore, safe to trust too much to the ignorance of the old people.

Another and not unimportant cause for the abandonment of old workings was the inferiority of the mechanical means then in vogue for clearing the mines of rubbish, or of pumping out the water. In some districts, and at particular times of the year, the water was very troublesome, and the old people, with their imperfect machinery, found it impossible to clear the mine; but this was not nearly so frequent a case as those who had old mines to dispose of were inclined to think. On the contrary, there was no doubt that, where the mines were at all valuable, a considerable amount of ingenuity had been displayed even in that respect. This was, however, a very fair question for speculation, as we were now, by means of the steam-engine, able, at a comparatively moderate expense, to overcome difficulties of this kind, which were utterly insurmountable to our forefathers.

There were some other reasons for the abandonment of mines; but some of these might be deemed local rather than general. Among these were occasionally to be ranked the prejudices and superstition of the people in the neighbourhood. In many parts of Germany, the inhabitants had superstitious objections to sink to any great depth—a rather curious objection for miners to have. Where, however, veins had been tolerably rich, they had permitted their interest to prevail over their fears; and there were cases in which they had gone down to very great depths. This, then, must not be taken as by any means a general rule.

There was another and a very powerful reason for the suspension of mining operations, and that was the want of capital. This was a cause likely to act in mines which required much draining, or long levels, or great depths of sinking, before a chance of success appeared. In these cases, want of capital had sometimes stopped the working of mines of great value, but this cause had more frequently happened in second-rate mines.

Among the many accidental causes which stopped the working of mines, one of the most frequently asserted, at least on the continent of Europe, was famine, pestilence, and war. When war approached any country in which mines were situated, that was one of the first branches of industry which was affected. The works were stopped, and the miners drafted into the army; and

under such circumstances, work which was of a speculative character, was but little likely to be continued. Generally speaking, when war began, mining ceased; and many promising mines had thus been suddenly stopped. Of course it might happen that, after many years of social anarchy, these mines would be completely forgotten. On the continent, it was frequently said, in speaking of old mines, that they had been stopped by the French Revolution. The wars resulting from that event might certainly have had that effect, particularly in parts of Germany and of Spain; but it was always necessary to inquire what other causes had prevented their early re-establishment.

Plague and famine had frequently stopped mining for a long time, though they were not things which would strike one *prima facie* as likely to have that effect; sometimes, again, where the mining was profitable only in a moderate degree, it might be stopped by a sudden change in the direction of industry, by which labour would be turned into other channels. Sometimes mining would be checked by the removal or imposition of protective duties, or by other political measures.

With regard to all these points, there was great difficulty of obtaining accurate information. The people who lived in the country, could always more easily communicate their impressions as to what had been done, than inform one what might be expected from a mine; but it was not that which had been taken away, but that which remained, respecting which information was to be sought. In determining the actual present value of old mines, a great number of things were necessary to be done. Among these, the primary investigation was that of the rubbish heaps; there would always be found about old mines, which had been worked to any extent, a quantity of rubbish, or *attle*; by that, it would be seen what had been got out of the mine, the nature of the veinstone, and the character of the prevailing ore. It might also be discovered, whether the people, who got out the ore, knew what they were about—whether they got all the ore, or left anything behind them. Supposing it were said a particular mine had been worked for copper—by looking at the *attle*, it would be seen whether or not that was united with any other metal; sometimes the *attle* itself was of great value. Silver was sometimes associated with copper, particularly near cross-courses; but the old miners did not know that—consequently, silver, and other metals, such as cobalt, might be looked for amongst the *attle*. So, again, although a vein might produce several metals, it was often worked for that which was least valuable. This might seem strange, but it had often happened, that the whole of the ore had been got for the sake of one metal; while other more valuable metals, which had only been discovered and obtained of late years by chemical means, were left in the rubbish. In such cases, a knowledge of the actual produce of veins could only be obtained from the rubbish heap. An examination of the *attle* was, therefore, necessary—not merely at the top, but at some depths, in order to tell truly of what it was composed. The next thing to which it was necessary to direct attention was excavation within the mine; of this there were two kinds—excavation at the back of the lode, and workings in the deep. It was generally considered, that the main level, for draining off the water, was the most important, and determined the measurements. Those parts, then, above that level, were called the back, and might first be considered. The examination in the back was naturally more feasible than in the deep. If the excavations in the back were very extensive, it was pretty evident the mine had paid, otherwise it would not have been worked so much in that particular direction. This being determined, the state of the walls must be looked at, by which it would be seen whether the vein was tolerably uniform or variable. If they found in one place an immense aperture, they might be sure the vein was one in which pockets, or nests, of ore had been yielded; if it were pretty steady, then there must have been a "course of ore." Observations in the back were generally more practicable than in the deep, as the latter was often filled up with rubbish.

In order to tell the extent to which the workings had been carried, a rapid examination, by a person accustomed to underground work, was amply sufficient. This also determined the way in which the working had been carried on. In mines where the workings had been steadily pursued, there would be a great quantity of material removed in the richer portions, and these would, of course, alternate with barren and unproductive trial drifts. This would show the degree of judgment with which the mining had been carried on; and, on the other hand, when a vein had been worked imprudently, nothing would be taken away but the ore; and, from the absence of trial works, it might then be presumed that no attempts had been made to go beyond that part which was manifestly valuable. Examinations of this kind gave a good idea of the value of mining property in old districts; and it might be taken as a general rule, that there was the best chance of success when the evidence showed that the mine had been carefully worked. Another point to be considered was, supposing the mine to have been left, in consequence of the irregular branching of the veins, what the direction was in which those veins were continued. If they branched out widely, and gradually died away in strings, showing a strong disposition to diverge from the original inclination of the lode, it would not be wise to carry on the workings far in the direction of the lode, as this was certainly a bad sign; but, if many strings, or branches, exhibited a tendency to meet, and the old people had not shown a disposition to go on, it was a fortunate thing for their modern successors. Now and then such a case might occur; but the result of his (Prof. Ansted's) experience was, that the old people knew too well what they were about to neglect such appearances as these. Another point was, whether the veinstone, or country, was of a description likely to yield produce; and whether the appearances put on were favourable or unfavourable. This was a point on which the Cornish miner, sent into another country, would be likely to be deceived. In Cornwall, there were certain laws which held pretty generally; and certain conditions of the veinstone, gossan, and country, properly considered as highly favourable for valuable ores. In other countries, these appearances might not indicate valuable ores at all. In Cornwall, a softening of the ground indicated the approach of a good gossan and a valuable lode; and, upon such appearances, the adventurer would be prepared with confidence to spend a great deal of money in continuing the workings; but in Germany, sometimes, the miner might have to go on through the hardest materials, and then suddenly come upon a veinstone which contained metalliferous produce of enormous value. As a means of determining facts of this kind, the appearances of other lodes already worked in the neighbourhood should be noted—and, indeed, this was always necessary, to avoid mistakes. The prevalent underlie of the lodes should also be observed. Besides these, it was important that the mining engineer should notice the methods of working in the neighbourhood, as a good deal of the style of the working of the old mines might thus be learnt. All these points were very important, because the expense of clearing out the old mines was enormously great, and the time required very considerable, since only a few men could be employed at once; and the quantity of rubbish to be removed was usually immense, and was sometimes even more difficult to get through than moderately hard rock itself. There was also this material difference:—In working originally, probably as much ore was daily obtained as paid all the expenses; while their later operations could only be conducted with a very remote expectation indeed of profit. To prevent such investigations, then, was of the greatest possible importance, if it were possible in any other way to come to any satisfactory conclusion as to the value of the property. The learned lecturer said, he had thought it necessary to go at considerable length into this subject, as there was little or no information on the subject to be obtained from books, or any other known source.

[The following lecture, which treated of the different modes of working metallic lodes, will be given at length in the next week's Mining Journal.]

## On the Composition of Coal Gas, and its Combustion.

DR. A. W. HOFMANN'S LECTURE AT THE ROYAL COLLEGE OF CHEMISTRY, HANOVER-SQUARE.

On Wednesday evening, March 29th, Dr. Hofmann delivered a lecture on the above interesting subject, at the Royal College of Chemistry, Hanover-square.—The chair was taken by the Right Hon. Viscount SANDON; and, in addition to many eminent chemists, a great number of gentlemen connected with the manufacture of gas were present.—The talented lecturer commenced with the remark that, in taking a retrospective view of the rapid progress which all the arts and manufactures depending upon chemical principles had made since the beginning of the present century, our attention was attracted more, perhaps, than by anything else, by the development of three branches—viz.: the production of sulphuric acid, the manufacture of soda, and the preparation of gas. The benefit which the community at large had derived from the perfection introduced in these manufactures could not be over-estimated; but, whilst the improvements of the sulphuric acid and soda processes had affected the state of society in a more indirect manner—viz.: by the assistance they had afforded to the progress of a vast number of other manufactures, and to the development of chemistry applied to agriculture—while soda and sulphuric acid had worked, and been working, in a more indirect and less perceptible manner, the advantages which society had received by the introduction of gas, were seen and felt by every one. They could not be misunderstood—they were as clear and as brilliant as the light which emanated from its combustion. If the enormous extent were considered to which gas was employed in this country for light, and a variety of other purposes—an extent of which the continent had not the least idea—it would be, perhaps, of some interest to trace the applicability of this valuable product to its origin. The evolution of inflammable gases from the ground, in different quarters of the globe, had been known from time immemorial. The most familiar instance in this country was, for a long time, the *fire-damp* of the miners. Jets of burning gases bursting out from the ground had attracted attention from a very early period; and whilst savage nations had been induced, by the grandeur of such a spectacle as a column of brilliant fire, apparently unsupported by fuel, to consider these spots as the abodes of their gods, the practical characteristics of others had been pointed out some useful applications of the spontaneous flames. The holy fires of Baku continued to burn to the present moment; and only

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lately a memoir had been published, under the rather curiously sounding title of *Chemical Analysis of the Holy Fire of Baku*. They were still worshipped by some of the savage tribes in the neighbourhood of the Caspian Sea. In China, according to some statements of Mr. Taylor, in the *Philosophical Magazine* of 1846, the borers for salt water, when piercing large beds of coal, had frequently met with jets of combustible gases, which they have used long since for the evaporation of their salt brines, and for lighting their factories. The attempt, however, of searching for the sources of these inflammable gases, and the idea of imitating the natural processes, and of employing the gases thus obtained for useful purposes, originated in this country. As far back as the year 1659, the relations between these jets and the coals beneath the surface, were pointed out by Mr. Shirley, in some experiments at the burning well of Wigan, communicated to the Royal Society. Almost a century, however, elapsed before the first attempt was made to prove the views of Mr. Shirley by experiment, and to extract the gas from the coal by artificial processes. The honour of having obtained for the first time the gas by distillation of the coal, was due to Dr. Clayton, Dean of Kildare; and he would read the original letter in which the reverend gentleman communicated the results of his experiments to the Hon. Robert Boyle. This letter was inserted in the *Philosophical Transactions* for 1739, and had lately been reprinted in an interesting paper on the "Manufacture of Coal-Gas," by Messrs. Barnard and Lock, and published in the *Pharmaceutical Times*. It was as follows:—

"I got some coal, and distilled it in a retort in an open fire. At first there came over only phlegm, afterwards a black oil, and then, likewise, a spirit arose, which I could not condense, but it forced my lute and broke my glasses; once, when it had forced my lute, coming close thereto in order to try to repair it, I observed that the spirit which issued out caught fire at the flame of the candle, and continued burning with violence as it issued out in a stream, which I blew out and lighted again alternately several times. I then had a mind to try if I could save any of this spirit, in order to which I took a tubulated receiver; and, putting a candle to the pipe of the receiver whilst the spirit arose, I observed that it caught flame, and continued burning at the end of the pipe, though I could not discern what fed the flame. I then blew it out and lighted it again several times; after which I fixed a bladder, squeezed and void of air, to the pipe of the receiver; the oil and phlegm descended into the receiver, but the spirit, still ascending, blew up the bladder. I then filled a good many bladders therewith, and might have filled an inconceivable number more, for the spirit continued to rise for several hours, and filled the bladders almost as fast as a man could have blown them with his mouth, and yet the quantity of coals distilled was inconceivable. I kept this spirit in the bladders a considerable time, and endeavoured several ways to condense it, but in vain; and, when I had a mind to divert strangers or friends, I have frequently taken one of these bladders and pricked a hole therein with a pin, and, compressing gently the bladder near the flame of a candle till it once took fire, it would then continue burning till all the spirit was compressed out of the bladder—which was the more surprising because no one could discern any difference in the appearance between these bladders and those which are filled with common air."

The experiment of Dr. Clayton was repeated on rather a large scale by Lord Dundonald, who amused himself by collecting the gas which issued from his coke furnaces. From experiments of this kind there was a great step to the idea of preparing gas for practical purposes. The merit of this idea belonged to Mr. Murdoch, of Redruth, in Cornwall, and a French engineer, named Lebon, who independently experimented on this subject at the end of the last, and the commencement of the present, century. The attempt, however, of Mr. Lebon failed altogether, the substance of which he made his gas being wood, which it was now known yielded a gas of very inferior illuminating power. He need not say anything of the complete success of Mr. Murdoch, though he had to overcome the multitude of difficulties which were in his way. After having, in 1792, lighted his own house and offices in Cornwall by coal gas, he succeeded in introducing it into the large factory of Bolton and Watt, in Soho, and gradually into several others, among which the extensive cotton mill of Messrs. Phillips and Lee, at Manchester, ought to be mentioned, where the new light emanated from near 1000 burners. It was, however, only at a later period, about 1812, that gas was employed for lighting the streets—a triumph due to the indefatigable exertions of Mr. Winsor, in consequence of which the National Light and Heat Company, since the London and Westminster Chartered Gas Light and Coke Company, was established. Since that time a great number of improvements had been introduced into the manufacture of coal gas. The plan of distilling the coal, and collecting the gas, had been materially perfected by Mr. Clegg, to whom we were likewise indebted for the first suggestions for the purification of the gas, which was now one of the principal points in its production. By judicious arrangements of the gas furnaces, Mr. Clegg effected a considerable reduction in the quantity of fuel which was consumed in its production. Mr. Lowe was the first to propose a peculiar method of increasing the illuminating power of the gas, by charging it with the vapours of volatile hydro-carbons. In consequence of these improvements, and a great number of others introduced by several other engineers, the article now consumed could no longer be compared with the gas, which was obtained at an earlier period, with respect either to quality or price. The first London club house was lighted with gas at the instance of Mr. Daniel, in 1820; and since that period it had been universally adopted, both in public edifices and in private houses. With the improvements in the production of gas, the perfection of the arrangements for consuming it kept pace—from the first simple jets, which soon became fish-tail and bat-wing burners, to the recent invention of Mr. Leslie's burner, a vast number of ingenious contrivances, for the most economical and healthy combustion of gas, had been proposed, and were being proposed every day. In order to show the immense extent to which gas was now used, he quoted the following statistics, for which he was indebted to Mr. Lowe: In England, nearly 6,000,000 tons of coal were annually consumed in the manufacture of gas, and from 15,000,000 to 16,000,000 tons of coal were employed in its production. In London and Westminster 4,500,000 tons of coal were annually used, producing 4,500,000,000 cubic feet of gas, and 500,000 chaldrons of coke; of the latter 125,000 chaldrons were consumed in manufacturing the gas, and the remainder was sent into the market for fuel. The number of houses burning gas in London was more than half a million, and the length of the mains was upwards of 1500 miles. The capital employed in London in the production of gas was 4,000,000.

After this short historical sketch, the talented lecturer proceeded at once to the more immediate subject of the gas, viz.: the composition of gas evolved in the distillation of coal. This composition was, by no means, constant; on the contrary, it varied to a considerable extent, depending principally on the nature of the coals, the presence or absence of moisture, and the temperature at which the distillation took place. Before entering, however, into details on the influence of these three different conditions, he would direct the attention of his auditory to those compounds which had been found to be produced in the distillation of coal. The chief elements which constituted coal were carbon and hydrogen, with small quantities of nitrogen and oxygen; and, according to the quality of the coal, a large or small amount of sulphur was also present. Frequent impurities were sulphur, this sulphur occurred almost invariably in combination with iron, in the form of iron pyrites. The quantity in which it existed varied very considerably; many kinds of coal contained so large an amount that they became altogether useless for the purposes of distilling gas. If coal were ignited, and atmospheric air excluded, a portion of its elements were evolved as gas, and the remainder became solid. The gases thus evolved contained carbon, hydrogen, nitrogen, oxygen, and sulphur. None, however, of these elements, except nitrogen, were found in an uncombined state among the products of the distillation of coal. The learned lecturer here exhibited two tables, exhibiting the different combinations into which these elements entered during distillation, which, with several others, were exhibited on the walls of the lecture-room. These combinations were very numerous, and he had divided them into two groups:—viz.: substances which were solids or liquids at the ordinary temperatures, and compounds which present themselves at the common temperature, in the form of gas. The first table (coal gas naphtha) was as follows:—

ACID PORTION.			
Hydrate of phenyle	C 12	H 6	O 2
NEUTRAL PORTION.			
Benzol	C 12	H 6	H 6
Toluol	C 14	H 8	H 8
Cumol	C 16	H 10	H 10
Naphthalene	C 20	H 8	H 8
Paraphthalene	C 20	H 12	H 12
Pyren	C 15	H 3	H 3
Chrysene	C 12	H 4	H 4
BASIC PORTION.			
Aniline	C 12	H 7	N
Picoline	C 12	H 7	N
Leucoline	C 18	H 8	N

Note.—The letters represent—C, carbon; H, hydrogen; O, oxygen; N, nitrogen, and the figures designate the number of atoms of which each volume is composed—thus, one atom of aniline contains 12 atoms of carbon, 7 of hydrogen, and 1 of nitrogen. They would find here a series of substances, of which he could now scarcely mention more than the name, although each of them was highly interesting to the scientific chemist, whilst several were, likely to become of high practical utility. These substances, along with others, which were little known, constituted the complex viscous mixture called "tar;" and it was rather singular that many of them, in their separate form, were oils, possessing the most delightful odours. The second table exhibited the different constituents of the gaseous products of the distillation of coal, as follows:—

CONSTITUENTS OF COAL GAS.			
Name of Constituent.	Proportions.	Spec. Grav.	Products of Combustion.
Hydrogen	CH <sub>4</sub>	0.5528	Water.
Light carburetted hydrogen	CH <sub>2</sub>	0.5528	Water and carbonic acid.
Oil-gas	CH <sub>2</sub>	0.9674	Water and carbonic acid.
Volatile hydrocarbons	C <sub>2</sub> H <sub>4</sub>	0.9674	Carbonic acid.
Carbonic oxide	C <sub>2</sub> O	1.6010	Carbonic acid and nitrogen.
Cyanogen	C <sub>2</sub> N <sub>2</sub>	0.6690	Carbonic acid and sulph. acid.
Sulphide of carbon	C <sub>2</sub> S <sub>2</sub>	0.6897	Water and sulphurous acid.
Sulphuretted hydrogen	H <sub>2</sub> S	0.2114	Water and nitrogen.
Ammonia	NH <sub>3</sub>	—	—
Sulphureous acid	SO <sub>2</sub>	—	—
Hydrochloric acid	HCl	—	—
Aqueous vapour	H <sub>2</sub> O	—	—
Nitrogen	N <sub>2</sub>	0.9730	Incombustible gases.
Carbonic acid	CO <sub>2</sub>	1.5203	—

In this table, they had, first, hydrogen, with which they were all perfectly acquainted, as one of the constituents of water. From it was obtained a colourless transparent gas, remarkable for its low specific gravity, being one of the lightest substances known. It burnt with a pale blue flame, which was scarcely visible, requiring a volume of oxygen of 2½ volumes of atmospheric air, for its combustion. It was, therefore, the luminous principle of coal gas. [The talented lecturer illustrated, by lighting a quantity of hydrogen gas. He also illustrated, in a similar manner, the peculiar luminous qualities of each constituent.]

The next was light carburetted hydrogen, or marsh gas; which was a compound, combining a proportion of carbon with two equivalents of hydrogen (CH<sub>4</sub>). This gas, along with carbonic acid, is produced by the putrefaction of vegetable substances under water—hence its name of marsh gas. It burnt with a pale bluish flame, rather more substantial than that of hydrogen—though it was also evident that it could not be, more than the other, the illuminating principle of coal gas.

They next had to consider the chief constituent of coal gas—namely, oil-gas—a name derived from its property of producing, when in contact with chlorine at the common temperature, a peculiar aromatic oil (of which a specimen was exhibited). It had also, in honour of its inventor, a Dutch chemist of the last century, been called the *Dutch liquid*. It very much resembled chloroform, and he (Dr. Hofmann) had no doubt but that it had also the same remarkable properties. It was far richer in carbon than marsh gas, the per centage of the latter being only 75, while that of the former was more than 85. Oil-gas burnt with a beautifully brilliant flame, constituting the true illuminating principle of coal gas. It required for combustion to one volume of oil-gas, three of oxygen, or 15 of atmospheric air. Marsh gas, it would be seen, was composed of one atom of carbon and two of hydrogen; while oil-gas combined the two in

equal quantities. There was, therefore, a large amount of carbon in this gas, which the talented lecturer proceeded to prove in a striking manner, by lighting an admixture of one volume of oil-gas with two of chlorine, which produced hydrochloric acid, and deposited all the carbon contained in the gas in a cylinder, in the form of a dense smoke, which rendered the glass perfectly opaque.

[To be continued in next week's Mining Journal.]

#### INSTITUTION OF CIVIL ENGINEERS.

APRIL 4.—JOSHUA FIELD, Esq. (President), in the chair.

The second part of Mr. Jackson's paper, "On the Engineering of the Rhine and the Moselle," was read. It consisted to considerable extent of a translation of an account of the spurs, groyens, and other works on the Moselle, for restricting the dimensions of the river, and increasing the depth of water, so as to enable the navigation to be carried on, which would otherwise be averted in the low-water seasons. It was shown, that to effect this, numerous arms of the river had been dammed across, and allowed to silt up; the course had been straightened, elbows had been cut off, and the convex shores, after being silted up by deposit between the groyens, were defended by arming of facies, &c. Division banks had been established for the inflowing rivulets, so as to carry the gravel to a greater distance down the stream. Rocks also were removed by powder, and general improvements to such an extent were executed, that the river was comparatively under good control.

The account of the Rhine was then resumed, and, after detailing the various plans that had been proposed for ameliorating its course, giving numerous interesting and valuable tables of Blanken's and Bolstra's experiments as to the tides, the inclination of the bed of the various rivers, the duration of the ebb and flow, and average height of the river at the time of new and full moon, the height of various dykes above the extraordinary flood-line, &c., the paper finished with these general views. On looking at the map of Holland, and tracing its various streams, it certainly does not appear singular that frequent stoppages should take place in that country, whilst such occurrences are comparatively rare in Germany; for, as long as the Rhine retains its single course, as at Emmerick, no obstacles, excepting elbows, stay the progress of the current seawards; but, as soon as it divides at the Waal and Pannekoek Canal, the evil commences and increases, according to the number of arms and channels lower down. It is generally agreed that a river should have as few outlets as possible, in order to allow it the more effectually to clear itself; and that the tide should be admitted as far as possible, whilst, at the same time, the action of the winds should be diminished, again, that the more the surface water of any river is abstracted, the more quickly the sand will accumulate; and also that, if a cut be made, it is usual for ice stoppages to take place below it, so as to raise the water level above; and it is also agreed, that if a cut be made, as capacious as the river itself, or be permitted to increase to that extent, it will soon get beyond control, whilst the sand will accumulate rapidly—and that when openings exist in dykes, the ice gets into eddies, loses its velocity, and by degrees closes up the passage below the opening, so as to raise the water above. The question, therefore, to be solved with regard to Holland and the system followed in order to prevent breaches in dykes, and to save the better part of the country (taking into account its weak, marshy soil, and its incapacity to withstand any great force), is whether it be the better plan to relieve the pressure on the dykes, by cuts and new channels, and local floodings, at the expense of increasing the number of ice stoppages; and, at the same time, diminishing the velocity in the main rivers, thereby greatly augmenting its liability to accumulating sand. It is true, as already stated, that the rivers are at present in such a condition, that it must be very expensive to effect anything of importance; but the question is of such vital importance to the port of Rotterdam, and the certainty of the mouth of the Meuse at the Brielle in the course of time closing up like that at Katwyk, if no improvement be attempted, is so clear, that it is very much to be regretted some steps have not been taken ere this to prevent so great a flow of water from passing out by the Hollandia dipe to Helvoet.

The author directs the attention of the institution to this subject, and directs the following points for the consideration of the members:—"That the object to be aimed at, in any steps which might be adopted for improving the Rhine as a navigable river, should be to prevent and strengthen the shores and dykes likely to be operated upon by the alterations; to straighten all the curves on the Leck, so as to lessen chances of ice stoppages; to separate the Waal and Meuse waters as much as possible, and to lead off the former, together with the Leck, into the sea by the Brielle; to narrow the Breschob channel (now divided) into one, regulating the quantity of water; to close the Krabbe, the Noord, and the Spree, with sluice gates; and, for the purpose of widening the outlet, to join the island of Rosenberg to the main land at Vlaardingen—thereby causing the ebb water to act upon this island, and with increased velocity, and an additional quantity of water, attempting to remove the bar and shoals."

At the monthly ball, Messrs. F. C. Fenrose, R. Hughes, H. Currey, F. P. Smith, and S. Wood, were elected associates.

The paper announced to be read at the meeting on Tuesday, April 11, was, "An Account of the Works at the Corbet Lough Reservoir, being a continuation of the Account of the Bann Reservoirs," by J. F. Bateman, M.I.C.E.

#### LITERARY NOTICE.

*Cosmos: Sketch of a Physical Description of the Universe.* By ALEX. VON HUMBOLDT. Translated by Mrs. Sabine, under the superintendence of Lieut.-Col. E. Sabine, R.A. For. Sec. R.S.—Vol. II. London: Longman and Co.

The *Cosmos* of Humboldt is one of the most extraordinary literary productions of these enlightened times. It is, as its name implies, a history or description of the universe as one harmonious whole; and it begins with the depths of space and the remotest nebulae, and thence gradually descends through the starry region to which our solar system belongs, to the consideration of the terrestrial spheroid, with its aerial and liquid coverings, its form and materials, its temperature and magnetic tension, and the fulness of organic life expanding and moving over its surface under the vivifying influence of light. Such a universal sketch, though drawn only, as it were, with a few strokes of the pencil, must comprehend from the unmeasured celestial spaces to those microscopic animal and vegetable organisms which inhabit our pools of standing water and the weathered surfaces of our rocks; and probably M. Humboldt is the only modern philosopher possessed of the requisite powers and qualifications for such a gigantic task. All that can be known by the senses, and all that a persevering study of Nature, in every direction, has revealed up to the present time, constitute the material from which such a representation must be drawn, and it must contain within itself the evidence of its truth and fidelity. As our knowledge of Nature is the result of successive ages of observation, tried by the tests of modern science, a physical cosmography or picture of the universe must display, not so much the grounds of our knowledge, as that which is known. Discarding, then, the technicalities and formula through which our advance has been made, M. Humboldt's *Cosmos* places the reader upon a philosophic height, from which the heavens and the earth, in all their manifold glories, may be familiarly viewed. The original work is divided into three volumes—the first (Mrs. Sabine's translation of which was published in 1846) takes a general view of Nature, comprising celestial, terrestrial, and organic phenomena; the second; the history of the earth, as developed by the study of Nature in mankind, and gives a history of the physical contemplation of the universe; the third and last portion is designed to furnish, as an elucidation of the general picture of Nature given in the first volume, those results of observation on which the present state of our scientific opinions is founded, and to show that the knowledge yet acquired is but a very inconsiderable portion of that to which, in the advance of activity and of general cultivation, mankind will attain in succeeding ages.

Passing, then, the domain before us, from the domain of objects to that of sensation, Humboldt proceeds to consider the impression which the image received by the external senses produces on the feelings, and on the poetic and imaginative faculties of mankind. He enters into a delightful discussion respecting the comparative want among the ancient Greeks and Romans of the sentimental interest with which we moderns attach ourselves to natural scenes and objects. The diffusion of Christianity rendered man's contemplation of Nature more free, and from that period picturesque sketches became more frequent. The tendency of the Christian mind was to show the greatness and goodness of God in the result of successive ages of observation, tried by the tests of modern science, a physical cosmography or picture of the universe must display, not so much the grounds of our knowledge, as that which is known. Discarding, then, the technicalities and formula through which our advance has been made, M. Humboldt's *Cosmos* places the reader upon a philosophic height, from which the heavens and the earth, in all their manifold glories, may be familiarly viewed. The original work is divided into three volumes—the first (Mrs. Sabine's translation of which was published in 1846) takes a general view of Nature, comprising celestial, terrestrial, and organic phenomena; the second; the history of the earth, as developed by the study of Nature in mankind, and gives a history of the physical contemplation of the universe; the third and last portion is designed to furnish, as an elucidation of the general picture of Nature given in the first volume, those results of observation on which the present state of our scientific opinions is founded, and to show that the knowledge yet acquired is but a very inconsiderable portion of that to which, in the advance of activity and of general cultivation, mankind will attain in succeeding ages.

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The remainder of the volume is occupied with a detail of the principal epochs in the contemplation of the universe, passing in review over more than 2000 years—from the earliest state of intellectual cultivation among the nations who dwell around the basin of the Mediterranean, and in the fertile river districts of Western Asia, to a period, the views and feelings of which pass, by almost imperceptible shades, into those of our own age; and the history of the physical sciences gradually becomes coincident with that of the *Cosmos*. The history of the gradually developed knowledge and recognition of the universe as a whole, is presented in seven distinctly marked sections—or, as it were, in a series of as many distinct pictures—each of which is drawn with a wonderful completeness, and with a graphic vividness never wielded with greater force and effect than by Humboldt, and which seems almost like inspiration—the result of his intense admiration of Nature's sublime mysteries. We have never read a work more calculated to stimulate young and inquiring minds to a perseverance in the pleasant paths of science and literature, as the means of penetrating the yet unexplored secrets of Nature.

We join heartily with the *Edinburgh Review*, in thinking that when *Cosmos* shall be completed, "a work will have been accomplished, every way worthy of its author's fame, and a crowning laurel added to that with which Europe will always delight to surround the name of Alexander von Humboldt."

AN "OPENING" FOR GEOLOGISTS.—About 1000 cubic feet of Capt Point have fallen since Wednesday, and the beach now affords geologists, &c., an opportunity of getting some fine specimens from the gault clay which has fallen. —*Maidstone Gazette*.

#### GEOLOGY AND TOPOGRAPHY OF THE ISTHMUS OF PANAMA.

BY RYAN HOPKINS, C.E., F.G.S.

By reference to a prepared plan, it will be observed that the cordillera of mountains, forming the chain of union between the two Americas, is curved in the shape of an arc on the Isthmus of Panama—the convex side faces the north, the easterly portion runs in, a south-eastern direction towards Darien, and the south-west prolongation extends to the shores of the Pacific, from whence it again takes a westerly turn towards Veragua. The westerly part of the curve, between the rivers Trinidad and Gorgona, is broken, and the continuity of the chain interrupted by the oblique intersection of the River Chagres. Towards the north-east, between the sources of the Boqueron and San Blas, the chain forms a broad mass of great elevation, and sends out numerous lateral branches, from which the rivers Chagres, Pequen, and Boqueron take their origin, and also the Cascajal, which runs to the north. The old road to Portobello, which I took on crossing the Isthmus the second time, follows along the Boqueron principally on the bed of the river, owing to the rocky and precipitous nature of the banks, until numerous and deep waterfalls over basaltic rocks, which exist near its source, render it necessary to leave the river, and travel along the steep sides of the surrounding mountains. The heads of this river consist of various branches, one of which arises from the break existing in the cordillera, at the elevation of 700 ft., where the road across the mountain is carried; and from the same point another stream runs to the north into the River Cascajal. In consequence of the great convolutions of this river, and the rugged and rocky nature of its bed, a day and a half was formerly spent in ascending it by boats from the point of union of the Pequen to half its course. The river and the road being synonymous terms in this route, our road continued descending as before, but rather in the waters of the Cascajal than along its banks, over the hard, slippery, sharp, and broken edges of the primary slates that traverse it, until we came to within a short distance of Portobello. The great difficulties and obstructions, caused by inundations, which attend this route, and the choice made of such a direction, are a strong proof that the Spaniards found insuperable obstacles to the formation of a good road between Portobello and Panama.

From the pass in the mountain above alluded to, towards the west, the chain is divided into numerous longitudinal branches; one proceeds from Portobello, and terminates abruptly in the vicinity of this port, with an elevation of 600 ft.; the central branch falls towards the bay of El Limon, and the southern branch forms the limit of the River Chagres, up to the mouth of the Trinidad, varying from 400 feet to 900 feet in height, and having a few peaks of still greater elevation. The space comprised between these three principal ridges is full of a multitude of smaller ones, which form the channels of the rivers Agua Lucia, Gatun, Agua Clara, which fall into the Chagres, and of the Grande, Guanche, and Buenavista, which discharge themselves into the Atlantic. The gold washings of Santa Rita are situated on the central branch, between the rivers Clara and Grande. From the summit of the central cordillera, at Santa Rita (which was the direction of my third journey across the Isthmus), a commanding view is obtained of the chain, from the elevated point of separation to the east, as far as Portobello, and, on the other side, of the whole length of coast of the Atlantic, as far as Chagres, and from hence to the cordillera, in the vicinity of Cruces.

Reflecting on this elevated and dense mass of mountains, which intervene between Portobello and Panama, so deeply furrowed by so many rivers, we are led to appreciate the difficulties of undertaking to construct anything resembling a commodious road, diagonally from Portobello. I examined the cordillera in the rear of Portobello; and it appears feasible to open a mule road on the summit of the external ridges, crossing the rivers near their sources, and gradually descending along the top of the south side, towards Cruces, or any other convenient point on the River Chagres. The peones sometimes follow this direction, which is called the new road, and it is, doubtless, preferable to that of the Boqueron. The distance from Portobello to Panama, in a direct line, is about 40 miles; by the Boqueron, including the turnings, 60; by the top of the cordillera, including deviations and turns, 58; by Chagres, along the River Gorgona, 42, and from Gorgona to Panama, 19—61; from the Bay of Limon, along the east bank of the Chagres, by Gorgona, to Panama, 35 miles. The last is the most direct and shortest road, and the one which appears to me to present fewer obstacles than any other to the formation of a railroad across the Isthmus. The Bay of Limon is equally the only port, besides Portobello, adapted to this purpose, on the Atlantic coast, within the described limits.

The corresponding part of the principal chain to the south of the Chagres, near Gorgona, is divided into a number of conical mountains; but, further on, towards the centre of Trinidad, they unite into a cordillera, of an average elevation of 500 feet. The space between this chain and the river of Trinidad is composed of marshy flats and isolated pyramidal mountains. An opinion prevailed, that there existed an almost insuperable level from the junction of the Trinidad with the Chagres, and that a canal could be easily cut in this direction, which would simply require locks (*represas*) at each extremity; but this illusion has been destroyed by Señor Garza, chief engineer of the royal corps of miners, who examined this portion of the Isthmus, and informed his Government, that it would be necessary to construct 33 locks (*represas*) and a large tunnel, to effect this object between the two seas. Alas! the great obstacles presented by the locality to an undertaking of this nature, place such a plan out of the question—so gigantic a work as a canal for vessels, which would require so much capital and time, must be left to a future generation, when the commerce and prosperity of this portion of the globe shall justify such an undertaking. The time has, nevertheless, arrived, when public attention should be directed to some practical step, as the trade between the two seas across the Isthmus is on the increase, and, consequently, some immediate and important improvement is required to facilitate the transit.

The surface between Gorgona, Cruces, and Panama, gradually, and with gentle undulations, slopes towards the Pacific, and is covered with various groups of conical hills, decomposed rocks, coloured clayland, and loose stones. A section, from the mouth of the River Chagres to Chonera, presents a very gradual ascent, as far as the marshy land near the base of the cordillera of Trinidad, then a rapid ascent of 450 feet, followed by a corresponding fall to the Pacific. A section, from the centre of the Cordillera, near Gorgona, shows a succession of deep undulations as far as Gorgona, and from thence a gradual fall to the coast. Another section, from Portobello, begins with a rapid ascent from the port; it then follows the turns of the rocks and falls of the rivers Grande and Gatun, amounting to an elevation of 1000 feet, and concludes with a rapid descent to the River Chagres. A diagonal section, from the mouth of the Chagres, along the river, as far as Gorgona, and from thence to Panama, embraces the lowest point of depression between the two seas—the highest point in this section is between the rivers Grande and Gatun, which does not exceed 150 feet; consequently, with regard both to level and distance, this line offers greater attraction and facilities than any in another direction, for making an easy and comparatively cheap communication across the Isthmus.

Notwithstanding the want of a port at Chagres, and the excellency of the port of Portobello, the first place is made use of, and is at present the only profitable point for the transit. As there is little or no coasting trade (*comercio costero*) worth mentioning, nor any internal trade, the ports are rendered dependent on the facilities afforded by the localities for the purposes of internal transit: this is the reason why Chagres has deprived Portobello of its shipping, and caused it to be almost abandoned. There ought to be some prospect of increase in the internal resources—i.e., in the production and consumption, and not merely in the transport, to justify the formation of anything better than a good mule-road from Portobello to the south of the great chain. A good mule-road would answer for passengers, money, and light articles; but it would not serve the general purposes of commerce, as it would probably increase the expenses and delays, and would be more subject to deterioration than the present road; it would increase the cost of shipping, but would add to the cost of transit; and, if a road is required, is to give increased facility to the transit, in order to secure the advantages and pre-eminence of this route by the Isthmus; the shipping would necessarily increase, and ways and means would be found to provide commodious ports, or rather to improve the existing ones for their reception.

It appears to me that this great question, of improving the communication between the two seas, ought to be considered as a *sine qua non* by the Government, and that every resource should be employed, and every effort ought to be going on, to effect it, in order that the work may be undertaken with the probability of its being completed without delay. It is sure to be executed some day, therefore the sooner it is taken in hand the better. The advantages that it would cause to be derived by the western coast of New Granada, independent of the Isthmus, would be immense.

The geological character of the Isthmus is very simple, and is easily examined: with the exception of the schistose channel, which crosses it in the meridian of the Boqueron and the granite line between Pequen and San Blas, the whole is composed of porphyritic and hornblende rocks, which gradually pass from one to the other, and run in layers, more or less, in a northerly direction. The schistose rocks are largely developed in the Boqueron and the Cascajal, and the laminated structure of the hornblende rocks is well defined, their inclination varying from east to west, according to the contortions and other disorders arising from the lateral pressure in the mountains enclosing them. The predominant ingredients are visible in the mass, and give rise in the rock to numerous colours, as black, green, blue, white, brown, and bright red. The whole part of the chain to the west, the mass is hornblende, but subject to the usual variations in its structure, alternating between porphyry, greenstone, and basalt, conformably to the changes in the relative proportions of hornblende and felspar. There is a great deficiency of silica in these rocks; quartz in crystals, veins, or masses, is rare; lime is equally scarce, but iron is very abundant, and exists in different degrees of oxidation. These rocks are very susceptible of decomposition, particularly when iron is the predominant ingredient; large fragments of decomposed rock, containing globular pieces, which resist ulterior decomposition, are numerous, and constitute the principal superstrata of the Isthmus.

Persons who have not studied this phenomenon of decomposition *in situ*, will imagine that these round and hard nuclei (of the size of large lungs of flint) were the result of rolling, and will from thence conclude, that the surrounding deposits are the mechanical product of aqueous decomposition. This sort of spherical exfoliating decomposition, until scarcely a vestige of the original rock is perceptible, is common to the granites and porphyries of the Andes, and black schistose rocks, and is also frequently found filled with a species of efflorescence of gypsiferous sand; and when this is surferous, the gold is found mixed with iron. In the course of time, the pieces scale, and the masses crumble; and, being gradually carried by the rains to the cavities and valleys, secondary deposits are formed of marl (*preda*), sand, conglomerate, or gravel, which, in these warm climates, are soon consolidated into compact beds.

The town of Panama is situated on secondary argillaceous deposits, in layers and fragments of comparatively recent date, and very strongly impregnated with iron. A great part of the upper portion of these deposits, to the depth of several inches on the sea shore, is composed of oyster-shells and red sand; interstratified, are found soft seams of aluminous white magnesia, and likewise some yellow and grey layers, appropriate for building—some of which are sufficiently soft *in situ*, but become harder by exposure to the sun. The green and blue varieties, which are found of different degrees of hardness, are susceptible of rapid decay, owing to the absence of siliceous, or calcareous matter in the original compound, to form a cement for binding together the sedimentary deposits. Lime for building is a marine production, obtained principally from shells; and, in consequence of the excess of phosphate, and the absence of silicate of lime, and pure argillaceous sand, there is great difficulty in obtaining a good composition for works exposed to the action of water, or hydraulic lime. Even to make lime for ordinary purposes, the utmost care is required to wash the saline matter from the shells; if this is neglected, the lime is spoiled, and does not easily bind. The foregoing secondary deposits, which of Barrocas—the white argillaceous deposits between Cruces and El Pregon, and Calimello, are all the secondary rocks I have seen. There are a few calcareous-aluminous rocks, interstratified with felsparic deposits, near St. Juan, but, correctly speaking, they are not deserving of notice. The lime on the shores of the Atlantic, and likewise the building-stone, is obtained exclusively from the coral rocks, which so beautifully and exuberantly vegetate on the hornblende shore of Portobello. The town and fortifications of Portobello are entirely built of coral, and they appear very durable. The persons who have hinted at the existence of limestones and fossiliferous strata, in the Isthmus of Panama, must have been mistaken, and were evidently unacquainted with the geological position of these rocks. The question will now naturally arise—where are we to procure materials for a road in a country where there is so absolute a deficiency of these requisite articles? because, in case of either improving the present mode of transit, by means of an ordinary road, or making a road for carts and horses, in both cases it will be requisite to prepare the localities intended for the reception of cattle and construction of bridges.

Gravel, or hard and rough stones, can be obtained from the decomposed basaltic rocks; the sandstone must be rejected, being unfit to make a hard and durable surface; which, by means of a cart-road, can easily be conveyed to any part of the Isthmus, and with



much greater economy than by the ordinary road. It will be necessary to make the bridges high and wide over the Gatun and the Chagres, which can only be effected by means of timber, judiciously combined with wrought-iron, constructing them on the principle of *cabo de gaudura*—the sketches of which including the road and quay (*muelle*) of Panama, will be forthcoming in due time, together with an approximate calculation of the cost. In case the material line should not be determined on for the ordinary road cutting, and constructing dykes and bridges, the advantages of a carriage-road over a mule-road would be trifling. In reality a soft road, embracing a number of useful ascents, and following the undulations of the precipitous hills, would be inferior to a good mule-road. It is important to consider this point attentively, beforehand, to avoid the mistake of supposing that a mule-road, converted into a carriage-road, would produce the anticipated advantages. If the gradients are well executed, it is a feasible project to construct an iron cart-road (*ferré carril*), from the Bay of Limón along the eastern bank of the Chagres—and this can be performed with a moderate outlay, the transit performed in 9 or 10 hours, and merchandise transported with celerity, and at an insignificant cost; one horse on an iron cart-road (*ferré carril*) will do the work of six on an ordinary road; the casual and necessary expense will be less, and the best materials could always be procured, owing to the great facility of transport.

The foregoing observations have reference to the transit from sea to sea; they have no connection with those provincial works and improvements which are being carried on, and which are so much required to facilitate the traffic between different parts of the country.

**MINES.**—There are no metalliferous veins in the Isthmus of Panama within the limits above described. Notwithstanding that, generally speaking, the porphyritic hornblende is auriferous, the gold is very sparingly disseminated; and, in the absence of lodes, or fissures, in the rocks, no natural concentration takes place; and, consequently, the precious metals cannot be obtained until the rock is decomposed, and the gold partially concentrated in pools, by the agency of the rains. The inhabitants of these auriferous districts are well acquainted with the places in which the gold is collected; they are also expert washers; notwithstanding, in consequence of the small quantity of gold obtained, and the excessive labour required to remove the accumulation of stones, they seldom gain more than 4 reals a day—rather less than more; and yet, in the face of repeated misfortunes, they are so infatuated with this work, that they are unwilling to abandon the labour of searching for gold, in order to direct their energies to a more certain and profitable occupation. Sometimes rich pools (*pozas*) are found—this is reported to have taken place at Santa Rita and Pequeña; these fortunate casualties serve to keep alive the fevered fit, and, when they occur, they generally occasion the loss of much useful capital and labour, by the excitement produced, and the consequent search for gold lodes; which mistaken notion is fostered by the supposition that all minerals, or metals, which proceed from lodes; under the same erroneous impression, poor gold lodes are worked—their only merit consisting in vague traditional reports, that some rich deposits had been formerly discovered in the vicinity. The gold washings are commonly called "mines," and the term *mine* leads to the supposition of the existence of metallic veins, on account of the vague signification given by miners to metalliferous deposits. The gold-washers give the name of lode to all the small seams of ferruginous deposits, though they may be widely different in their character from true lodes; and, consequently, persons entering into these ruinous speculations, who are unacquainted with their nature by practical experience, are deceived; and, unfortunately, the elementary books on these subjects, instead of giving information, add to the confusion—and, thus it happens, that capital is frequently thrown away on useless speculations. The gold washings of Santa Rita and Pequeña are the products of decomposed auriferous rocks; and the gold is, as it always happens, of much purer quality and better standard than that obtained from lodes. The decomposed deposits of Santa Rita and Pequeña, situated on elevated cordilleras, are very unfavourably placed for water; the present washings are limited to the portions washed by the rains during the rainy season.

When it occurs that there are extensive plains covered with the debris of auriferous rocks, and that the rain has washed away a great portion of the lighter particles, the remaining mass is thereby rendered richer; such deposits merit attention, and, with economy, might be rendered profitable. The gold lodes (unless accompanied by quartz, or pyrites, constituting a gangue for the formation of a large lode, offering ample space for the reception and accumulation of gold) are very deceptive, and seldom productive. Gold is never found nor formed in a hard rock—it requires cavities and soft particles; and when it is crystallized, or accumulates in veins, these should be broad, porous, and approaching to vertical, in order to the formation of a rich lode.

The Isthmus of Panama is deficient in quartz and pyrites; and as these ingredients are so requisite to the development of productive lodes, there is little hope of any being found in this part of the country. The general appearance is very unfavourable to the existence of mines. I am not desirous of stopping the speculations in gold mines in this part of New Granada, but merely of preventing such projects from being too hastily undertaken, and of pointing out the necessity of previously obtaining authentic information, and exercising due precaution. The most important mineral in the primary rocks is copper; I can also add, that copper is likewise the most productive, or the only mineral of the primary class, that has been found profitable to mining companies. This mineral is found principally in the porphyritic granites, or their superior layers (*capas*) of transition of clay-slate. If such rocks exist in Veragua, copper may then be found in sufficient quantity to render it an object worthy of being sought for; but it would be waste of time to search for such mines in the rocks existing here. I have found a few specimens of hepatic iron in Pequeña, and great quantities of the peroxide and protoxide of iron; but as these can be of no service in this part of the world, it is unnecessary to dilate thereon; it is also useless to allude to the presence of silver, the descriptions already given being sufficient for the purpose.

Very fine trees are to be seen on the banks of the Gatun, especially of the species called cedar. Having crossed the Isthmus three times, I penetrated, on foot, through forests and rivers, and have been exposed to heavy rains, day and night, without suffering in health. I have no reason, therefore, to consider it unhealthy or to be reported to be so. The population appears small and inadequate for the purpose of public works; but labourers can, I have been assured, be procured from some parts of the interior. I am, however, of opinion that, if any important works are undertaken, an additional and more effective set of hands would be indispensable.

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## Mining Correspondence.

### ENGLISH MINES.

**ANTIMONY AND SILVER-LEAD.**—Capt. Charles Williams (April 5) reports—We have cut another antimony lode since Prof. Ansted was here, and since I last wrote you, about 18 in. solid, worth 20l. per fm.; and the cost of raising will not exceed 80s.; this lode is a little north-west of our shaft, and I have let to Morecomb and Co. 4 fms. for 3l. to sink on the lode; I hope you will be satisfied with this, and, in future, I would not recommend day-work for any man on the mine. We have also opened on a beautiful lead lode since I last wrote, not shown on the map; and I have no doubt we shall get ore very shallow. Prof. Ansted was perfectly satisfied with the prospects of the mine.

**BARBISTOWN.**—Captain Thomas Angove (March 31) reports—We are at present drawing the water out at Nangle's, and I hope in my next report to give you a statement of what ore we may immediately expect to raise from this part of the mine. The adit end east is producing from 10 to 15 cwt. of ore per fm.—we have driven 12 fms. on the lode, producing this quantity in this level; the back is working on tribute—but from the large flow of water, the bottom (although a much better lode), cannot be worked until we get a level under it from eastern flat-rod shaft; the pitches in the old mine look much the same. We shall commence to drive from Slob shaft in a fortnight under that part of 18 fm. level where the lode was stopped 6 fms. under the level on ore, with a view to unwater it—the Kiln shaft presents the same feature as in my last. Our quantity of ore to the end of March is from 22 to 25 tons.

**BEDFORD UNITED.**—The mine agent (April 5) reports—At Wheal Mafgu, the lode in the 90 fm. level, east of the sump-winze, is 3 ft. wide, and worth 30l. per fm.; the lode in Hodges's rise, in this level, is 2 ft. wide, producing good saving work; in the stopes, in the back of this level, the lode is worth 50l. per fm.; in the 90 fm. level, west of the sump-winze, there has been no lode taken down. The engine-shaft is now 9 fms. 3 ft. under the 80 fm. level. In the 80 fm. level east the lode is 2 ft. wide, producing good stones of ore. In the 70 fm. level east we are still driving by the side of the lode; this level west, on the south lode, is suspended. We have commenced driving the 47 fm. level east, in which the lode is 2 ft. wide, producing good stones of ore, and very kindly. At Wheal Tavistock, in accordance with your instructions, we have recommenced operations, by driving the 47 fm. level west of Phillips's shaft; the lode therein is 2 ft. wide, composed of spar, mundle, and ore. In the 25 fm. level, east of the south engine-shaft, the lode is 2½ ft. wide, and, altogether, more promising than for some time past; and in the adit east, on this lode, the lode is 18 in. wide, producing stones of tin. We weighed, at Morwellham, on Friday last, January ores 116 tons 16 cwt. 2 qrs., and sampled February ores, computed 124 tons (21 cwt.).

**CALLINGTON.**—Capt. J. T. Phillips (April 5) reports—You will be much pleased to hear, the lode in the stopes, in the back of the 70, continues to present the same flattering appearance—the ore part being from 5 to 6 ft. wide, a fine course of ore, and 10 tons per fm. is a moderate calculation; we have discovered this for 2 fathoms in length, and it appears likely to continue over the back.

**CARADON COPPER.**—Capt. W. Rule (April 5) reports—At the last general meeting of shareholders of this company, held at Webb's Hotel, Liskeard, some time since, I informed them, that I had little doubt but that we should intersect the lode, in cutting the pit in the 30 fm. level; and I have now great satisfaction in acquainting them, that such has been the result; it is 8 ft. wide, composed of soft spar, prinn, and peach, with fine stones of black and yellow copper ore. This mine has recently been inspected by some of the most practical and experienced agents of the district, who have unanimously come to the conclusion, that it is a very flattering speculation. The situation of this mine is very favourable, it being at the foot of the rich Caradon Hill; and the workings here are parallel with the productive courses of ore in South Caradon, and with the same cross-courses running through the sett, and it is fully expected to prove a rich depositary of ore. It is hoped, that this cheering information will tend to invigorate the drooping spirits of some of the unfortunate speculators in this neighbourhood, and induce them to persevere, to return their fallen fortunes.

**CARTHEW CONSOLS.**—Capt. W. H. F. Stephens (April 5) reports—Consequent on the insufficiency of water to work the wheel, we are obliged to suspend making below the 10 fm. level, at Valley shaft; also the driving of the ends, in this level, north and south; and our underground operations are now confined to the driving of the adit level south, and cutting down the engine-shaft in the old mine, and preparing, as we go down, for the reception of pitwork; with this work we are progressing very satisfactorily; we are now down about 13 fms. from surface; in the adit end a slide has intersected the lode, which we have not yet got through, and which, at the immediate junction, has very much disordered the lode, but has made a difference in fa-

vor of the price of driving the end of about one-third the late price. We have also six men clearing the foundation of the engine-house, which we have let at 1s. 4d. per cubic fathom. We have two men working in the quarry, where I find the stone being raised is very much improving in quality, which is a very great and important thing for our buildings, being so near the site.

**COATLITHE HILLS.**—The mine agent (April 3) reports—I expected to have been able to inform you by this, that we had cut the vein in the winze; but, owing to its having slipped more than we expected, it has not yet been cut through; from the appearance of the ground, I do not think we are far from it; and I hope we shall cut it this week, and find it good.

**COPPER BOTTOM.**—Captain John Richards, of the Consolidated Mines (March 25), reports—The sett is extensive, containing several lodes, which have been found to produce a pretty deal of copper and tin near the surface; and the indication is favourable for doing so at greater depths. A few years since, an engine was erected on one of the south lodes, and the shaft sunk about 40 fms. under the adit level on it; but at this point the lode was worked to a very limited extent. By a flat-rod from the engine, one of the north lodes has been worked to the depth of 20 fms. under the adit level; this lode has also had but a very imperfect trial, although copper and tin, to the amount of several thousand pounds' value, have been raised on these lodes, even at this shallow depth; at present the operations are confined to two lodes north of these, which are producing copper and tin sufficient (near the surface) to pay the cost at the present rate of working; but, for the more effectual working of the mine, an engine should be again erected in the old engine-house, and work the north lodes by a flat-rod from it, so as to prosecute the different lodes at greater extent and depth. This work cannot be accomplished without an outlay: an engine of sufficient power must be purchased, also necessary pitwork, and other machinery, to work the mine. To do this, and make the erections necessary to drain and fork the water and clear the mine, so as to begin operations on the lodes below the adit level, it will require a sum to be advanced from 2500l. to 3000l.; and I think, that taking the several lodes, and what can be seen of them at the adit level, and at shallow depths, they do fully warrant this outlay, and will again remunerate the adventurers with interest for the capital that may be required to put this mine in a regular and proper state of working.—P.S. Since this report, the new copper lode has been intersected at the adit level, thus opening more tribute ground; and the end west is exceedingly promising. Mr. Paull says we shall soon see it much better.

**COOMBE VALLEY QUARRIES.**—Capt. C. S. Richardson (April 6) reports—We have let the Island Quarry to six men, at about 8s. in 1l.; they are to employ as many hands under them as can possibly work; they expect to clear a cargo in a fortnight from this spot. The Allshard Quarry is let on tribute, at 4d. per dozen for rags, duffshells, or queens, and the removal of the overburden, in such portions at a time as the manager may require, at 1d. per ton, clear of the quarry; we propose, therefore, to employ 100 men. We have taken full possession of Crackington Harbour, and have commenced laying down an incline railway to the shipping place. Already have we had application to allow the fishermen to come in, and use our landing place; a full report will appear in the course of a few weeks.

**CWM ERFIN.**—Capt. S. Nicholls (April 1) reports—The stope, west of the whim-shaft, is looking just as last week, producing half a ton to the fm.; in the stopes, east of the whim-shaft, they have not taken down the lode this week, on account of the men drawing their stuff; but, as far as they have taken down the lead, it is rather improving; I think it will be above a ton to the fm. just now; the stope, west of the eastern shaft, is rather poor at present; we have got within 4 fms. of the end, where the lode is poor; in the meantime I cannot see any ore of any value. We have nearly finished cutting the plat; we shall make it ready to sink in another month.

**DEVON AND COURTENAY CONSOLS.**—Capt. H. Secombe (April 4) reports—In the end driving east in the 40 fm. level, on the gossan lode, we have intersected a slide, underlying east, and dividing the lode into branches; those branches contain mundle and ore, and are interspersed throughout the end. In the end driving north on the cross-course, in the same level, we have cut the gossan lode west of the cross-course; the lode is about 2 ft. wide, composed of mundle, spar, and spots of ore, in a good strata of favourable kilias. The lode in the end driving east, on the south lode, is 9 in. wide, composed of mundle, spar, and spots of ore. The ground in the engine-shaft has this week been rather harder than for some weeks past, the kilias being mixed with layers of spar.

**EAST CROWDALE.**—Captain Stephen Paull (April 1) reports—The sumpmen are still engaged cutting the plat in the 51 fm. level; the ground is much harder than calculated upon, and, consequently, it is taking a longer time to complete. The 47 fm. level, driving west on the course of the north lode, continues just the same in appearance as when last reported on—good stones of ore at times, but does not yield much saving work. In the rise and stopes, in the back of this level, there has not been much lode taken down in the past week, the men having been engaged in beating up a piece of dead ground, to lengthen the back; the ore ground being longer than when we began to rise, we shall have a good pile of ore from this place next week. We have commenced sinking in the bottom of the 47 fm. level east, but as yet cannot say anything of the appearance of the lode, there not having been any taken down in the past week. We shall commence on Monday to sink the engine-shaft at Rix Hill, the water having fallen back considerably since the dry weather set in. The walls of the new engine-house at Rix Hill will be finished next, and the loading for the stamps is completed.

**GREAT MICHELL CONSOLS.**—The mine agent (April 5) reports—That the lode in the sump-winze continues large and promising, containing mundle, fluor, and spar, with ore throughout, producing some saving work. In the 35 fm. level, west of the sump-winze, the lode is improved, producing some saving work, and laying open tribute ground.

**HEINGSTON DOWN CONSOLS.**—The mine agent (April 5) reports—We continue sinking Bailey's engine-shaft, in which the lode is 4 ft. wide, composed of gossan and spar, with good stones of tin. Buddle's adit level north is progressing favourably.

**HOLMBUSH.**—Capt. W. Lean (April 4) reports—The lode in the 120 fm. level south is 4 ft. wide, composed of spar, prinn, and stones of rich silver-lead ore—saving work; the lode in the rise, in the back of this level, is 3½ ft. wide, composed of soft spar, with spots of lead scattered throughout the lode. The lode in the 110 fm. level south is 5 ft. wide, composed of quartz and lead, worth 6l. per fm.; the lode in the stopes, in the back of this level, is 6 ft. wide, composed of quartz and lead, worth 6l. per fm.; the north end, in this level, we have set on tribute at 10s. in 1l. on the value of the lead only. The lode in the 100 fm. level south is 2½ ft. wide, composed of soft spar, prinn, and lead, worth 5l. per fm., with favourable ground for exploring; the lode in the winze, sinking below this level, is 3 feet wide, composed of spar and lead, worth 15l. per fm. The flap-jack lode, in the 100 fm. level east, is 3 ft. wide, with two good walls, between which are several strings of mundle, spar, and spots of copper ore. The lode in the 90 fm. level south is 2 ft. wide, composed of soft spar and lead—saving work. The tribute pitches are producing a fair quantity of lead ore. We sampled at Calstock Quay, on Friday last, February and March copper ores, computed 98 tons.

**KIRKCUDBRIGHTSHIRE.**—Capt. Jos. Buzzo (April 1) reports—That the lode in the 50 fm. level west end continues large; the south part, on which we are driving, is not so productive as it was; we propose now to drive north, to explore that part of the lode on which a winze has been sunk 5 fms. below the 40 fm. level, where there is a course of lead, yielding 1 ton per fm. The lode in the 40 fm. level end west is 4 ft. wide, producing stones of lead; but, inferring from the run of lead ground below the 30 fm. level before this, and we are naturally expecting to see an increase of ore; the lode in the end east, on the counter, in this level, is 3 ft. wide, yielding 6 cwt. of lead per fm. The lode in the 30 and west is 4 ft. wide; but as the lead part of the lode has not been taken down lately, I am unable to speak of its exact value. I should expect from 3 to 1 ton per fm.; the lode in the 30 and east is still in unsettled ground, notwithstanding it produces stones of lead, and from other indications, I hope soon to see an improvement. The lode in Keith's shaft is 3½ ft. wide, producing 1 ton of lead per fm.

**MENDIP HILLS.**—Captain F. C. Harper (April 3) reports—In extending the cutting towards the eastern, or more productive, slagground, I find the beds of stuff continue about the same thickness as for several weeks past (viz. 11 ft.), some parts of which are work of fair quality; the carpenters are still pressing forward as fast as possible with the enlargement of the dressing department, and have shortly to return a greater quantity of slags to the furnaces; the small furnace mentioned in my last is now completed, and I intend to commence re-smelting the lead into pigs to-morrow—shortly after we shall have several tons ready for market. The lode in the 35 fm. level, south of shaft, is about 2 ft. wide, composed of flookan, spar, iron, and limestone.

**SOUTH WHEAL MARIA.**—Capt. G. Francis (April 6) reports—We have now reached the counter lode in the south cross-cut—that which was laid open in making the wheel-pit; it is about 1 ft. big, composed of prinn, mundle, &c., with some good lead ore interspersed through it; the walls are regular, and underlying south towards the great cross-course 3 or 4 in. in a fm., from its present appearance, we calculate on reaching the south lode in less time than we should by continuing to drive in the country; there are about 12 or 14 fms. more to drive to reach the great gossan lode south, which we have no doubt will be accomplished in about three months from this time.

**SOUTH WHEAL TRELAUNY.**—Capt. W. Jenkin (3d April) reports—That Snell's engine-shaft is in course of sinking with nine men; ground a little harder—a light strata, mixed with spots of copper ore and mundle; the water is just the same as it has been.

**TINCROFT.**—Capt. W. Paull (April 3d) reports—There is no material alteration taken place in these mines since last report. I was underground at Palmer's last Saturday. The 80 and 70 ends west, on East Pool lode, are producing ore—the latter has rather improved in the past week; the eastern

winze, in the bottom of the 70, has been holed to the 80; another pitch may now be set to the west of the said winze; the western winze, in the bottom of the 70, is now drained dry, and is resumed sinking by the same men that sunk the other winze. The 60 end west, being near the boundary, is suspended, and the men put to sink a winze in the bottom, near the end, in order to ventilate the level below, which level we hope will be driven through the sett without touching the north boundary. The north mine, in the 90 end east, has rather improved for copper ore in the past week—there is no other alteration worth mentioning; in the south mine, the stopes and pitches continue to produce fair quality tin stuff, &c., on Highburrow lode; the 90 west, on Chapel's lode, and the pitches in the back of the said level, continue to produce good quality copper ore. At Wheal Providence, the pitch in the back of the 12 fm. level is looking well. Two men are engaged stopping the bottom of the 21 fm. level, to let down the water, in order to clear the eastern level. The sumpmen are driving east and west in the 34 fm. level—the lode is large and promising, with some ore; the cross-cut north, in the adit level, is nearly cleared out; the level may be examined by the end of this week. The tin sold, last Thursday, fetched 999l. odd; the tin stuff sold, on Friday, fetched 37l. By the statement of cost and returns, sent you on Saturday last, you will observe that 139l. 7s. 6d. profit is shown for January month; and I think you may fairly calculate on 400l. profit for February.

**WEST WHEAL JEWEL.**—Capt. R. Johns and T. Bray (3d April) report—The 57 fm. level, west of Williams's cross-course, on Wheal Jewel lode, is suspended—driven last month, 1 ft. 1 ft. 0 in.; we have been sinking a winze in the bottom of this level, in the past week, to communicate to the rise in the back of the 70 fm. level, west of Williams's cross-course, on the same lode; the lode is 1 ft. wide, worth 7l. per fm.—risen 1 fm.; in the deep adit, on the same lode, the lode is 15 in. wide, with good stones of yellow ore—driven 3 fms. 0 ft. 6 in. In the 80 cross-cut south, from Tolcarne tin lode, the ground is much the same for driving as when last reported—driven 3 fms. 1 ft. 6 in.; in the deep adit, west of Quarry shaft, on Tolcarne tin lode, the lode is 2 ft. wide, worth 4l. per fm.—driven 3 ft.; the shallow adit, west of Quarry shaft, on the same lode, is suspended; these men are put to sink Tregoning's shaft—driven last month, 3 fms. 4 ft. In the stopes in the 12 fm. level, west of Quarry shaft, on the same lode, the lode is 4 ft. wide, worth 30l. per fm. The measurement of the stopes will be sent in our report next week.

**WEST WHEAL MARIA.**—The mine agent reports—I beg to inform you, that the western engine-shaft is down below the 64 fm. level, about 6½ fms.—ground more favourable for sinking than last week. We have completed stopping the 34 fm. level, west on the south lode, and resumed the driving by 4 men, the lode in which is about 2½ ft. wide, composed principally of capel, spar, mundle, and occasional spots of ore.

**WHEAL ANDERTON.**—The mine agent reports—I find the engine-shaft in this mine has been sunk 5 fms. below the 70 fm. level, and it is being continued sinking to lay open an 80 fm. level. The 70 fm. level has been driven east about 17 fms., 12 fms. of which are through a cross-course, and the remainder on the lode east of the cross-course; here the lode is from 3 to 4 feet wide, producing some very good tin; this level has been driven west about 14 fathoms; the end is now in a small cross-course, but it has passed through about 12 fms. of good tin ground, where the lode is from 5 to 6 ft. wide. The 60 fm. level east has been driven through the same cross-course seen in the 70 fm. level; the end is now in a large lode, and producing a little tin; this level west has been driven about 25 fms. through a good piece of tin ground, and there is a large and promising lode now in the end. On the whole, I consider the mine is looking very promising—and I believe, when fairly laid open, it will be a profitable concern; but the length of ground at present explored is so very little, that large returns cannot be expected—in fact, the ground must be exceedingly rich to produce a profit with the present extent of workings. I would recommend the levels being extended, both east and west, with all possible dispatch, and I believe the result will be a profitable concern.

**WHEAL BARBARA.**—Capt. W. H. Stephens (April 5) reports—From my inspection to-day, I am pleased in being able to inform you, that the ground in the engine-shaft is somewhat easier than it has been of late. I am led to hope and think, that in future we shall be able to make greater progress in sinking, and that we shall cut the lode in the shaft at, or before, the end of the present month. The old, or Gray's shaft, is sunk about 3 fms. below the adit, where the lode is 2 ft. wide, producing some lead and copper ore, carrying by its side a beautiful flookan, thickly pregated with small grain copper, which, I think, is allowed by all miners to be very indicative of mineral wealth; and, I think, in the event of our getting through the hard ground, which we are now in, we shall soon be in possession of no small quantities. In consequence of the plenitude of water in Truscott's shaft, we are not able to sink without more immediate aid from the steam-engine, which we hope to have in a very few days, by the fixing of flat-rods from here to this shaft. Having tolerably well got through with the timbering of shafts, fixing of whims, and balance-bobs, our expenditure in this article, which of late has been very high, will, in future, be very much less.

**WHEAL MARY ANN.**—The mine agent (April 4) reports—The lode in the 42, south of the boundary, is 15 in. wide, and worth 7l. per fm. The lode in the 30 fm. level, south of Barratt's shaft, is 4 ft. wide, very kindly, composed of gossan, can, and quartz, but not much lead; the stopes, in the back of this level, are looking well. The lode in the winze, sinking under the 15 fm. level, south of Barratt's shaft, is 4½ ft. wide, and worth 16l. per fm. The lode in the 30, north and south of Pollard's shaft, is 1½ ft. wide, kindly, with some lead. The lode in the 15, south of Pollard's shaft, is 15 in. wide, very kindly, but at present unproductive of lead. Pollard's shaft is sunk 10 ft. under the 30 fm. level. We shall this day sample 60 tons of lead ore.

**WHEAL TREHANE.**—The mine agent reports—Kelly's shaft is now down 6 fms. below the 45 fm. level, and the ground is favourable; the lode, in this level, in both the north and south ends, is of just the same size and character, about 2½ ft. wide; but is not so good as it has been in the last 7 fms. driving, producing at present 4 cwt. of lead per fm.; we are rising in the back of this level, and sinking a winze to hole to the same from the 35, for ventilation and advantage in stopping; the lode in the rise is 20 in. wide, saving work; the lode in the winze is producing 6 cwt. of lead per fm. We have, in this month, been sinking Phillips's shaft on the course of the lode, which is now 6 fms. below the 35 fm. level; the lode is 2 ft. wide, producing about 5 cwt. of lead per fm.; the ground here is easy to break, and we have commenced stopping below this level, both north and south of the shaft; the lode in the stopes, from the back of the 35 fm. level, and the bottom of the 30 north, is producing 15 cwt. of lead per fm.; the stopes in the back of the 80 and 20 fm. levels are producing some good work. The last parcel of ores weighed 68 tons 5 cwt. 3 qrs., and sold for 1529l. 6s. 8d.

**WHEAL TRESCOLL.**—Capt. C. S. Richardson (April 6) reports—The contractors are within 4 fms. of completing the adit; the shaft is down 10 fms.; we have cut in this level, which is about 60 fms. of close driving, 22 lodes and branches, and every one of them carrying tin; one lode, which carries a pith of solid tin, is estimated to produce 2000 lbs. of black tin to the 100 sacks of work; and the very worst lode in the mine will make 200 lbs. to the 100 sacks. The contractors' time expires this day (April 8th)—they having driven 170 fms. of ground in eight weeks; and, as an encouragement to the men under their employ, they are going to give them a dinner on the occasion. The mine is already in a position to pay her own costs; and, when the engine is erected, a profit will immediately be made; a full report will appear next week. The directors are coming down to inspect the works, with proper mining agents, to see the several contracts have been duly fulfilled. A further report states—the mine is already in a position to pay her own costs; and, if we erect a 30-inch cylinder, we shall be able to go down 80 fms.—the cost of which, including pitwork, will be about 800l.; which, with buildings, roads, whims, shears, and 30 heads of stamps, at 400l., will produce 20 tons of tin per month—the average value at 48l., or being 960l.; this will keep employed about 100 men—the cost of whose labour will be about—

Labour, 2000; carting, 250; engine cost and repairs, 300.....	£260 0 0
Iron, timber, ropes, powder, &c.....	100 0 0
Agency on the mine, 17l.; company's expenses, &c., 40l.....	57 0 0
<b>Lords' dues.....</b>	<b>2463 0 0</b>
	<b>64 0 0</b>

Total.....£2927 0 0  
Produce—20 tons of tin, at 48l.=960l.; deduct expenses, 527l.—leaves 433l. net profit.

**WHEAL TRELAUNY.**—Capt. John Bryant (April 4) reports—We have not yet got into the main part of the lode in the 62 fm. level at Phillips's shaft; but, from the great quantity of water flowing from the end, I think we are near it; the capels here are much larger than either of the levels above, and being hard, with so much water, our progress has not been so great as we could wish. The lode in the 62 north is 4 ft. wide, composed of can, spar, mundle, and lead, worth 5l. per fm.; in this level south the lode is 2 ft. wide, chiefly can, with lead intermixed, and worth 8l. per fm.; the stopes, in the back of this level, are improved since my last visit, particularly to the south of the shaft, where the lode is worth 20l. per fm. The lode in the 42 north is 2½ ft. wide, chiefly composed of can, and producing a little ore, but not rich; the ground in this end is not so hard as it has been—consequently, I expect an improvement in the lode shortly; the stopes, in the back of this level, which are rather hard, are producing a fair quantity of lead. The lode in the 32 north is 5 ft. wide, composed of can, spar, mundle, and lead, worth 1 ton of ore to the fm.; we commenced stopping about 5 fms. behind this end, where the lode will produce from 10 to 12 tons of lead per fm. Trelawny's engine-shaft is sunk 9 fms. under the 42 fm. level; the ground is clear kilias, and favourable for sinking. We intend fixing a plunger-lift in the 52, for which purpose we are carrying the shaft 2½ ft. longer, for pole connection, &c. The 22 cross-cut east is still in driving, by 4 men, in a clear kilias. At Vivian's the lode in the 30 north is 3 ft. wide, composed of spar, can, and lead, worth 6l. per fm. We sampled, on Thursday last, 50 tons of ore, which will be tendered for on the 6th inst.—April 5.—I take the earliest opportunity to inform you, we



## FOREIGN MINES.

## MINING NOTABILIA.

[From the *Plymouth Journal*.]

**THE COAL TRADE AT WHITEHAVEN.**—We regret to announce, that some of the pits at and in the neighbourhood of Whitehaven, are closed for the present, on account of the inactive state of the market. Vast quantities of coal are lying on the pit's banks, waiting for orders for shipment.—*Carlisle Patriot*.

## TUTWORK AND TRIBUTE

### MINE SETTINGS—TUTWORK AND TRIBUTE.

**ST. JOHN DEL REY MINING COMPANY.**

In your Journal of the 4th March, you inserted a few lines from me in which I denounced several charges, which had previously appeared against the present management of this company's affairs in Brazil, and called upon the directors for a reply. The following Numbers (the 11th and 16th) contained letters on the subject of slavery general, and the employment of slave labour by English companies; but nothing in shape of an answer to my letter was given until last Saturday, when your paper published a long and well written article from "A Proprietor," who has had access to the private correspondence. Without doubt, he is one of the directors of the company. St. John del Rey Mining Company have ever been desirous to do all in their power for the happiness and comfort of the blacks in their employ, I was pleased to see the deep interest they take in their welfare; but, beyond this, I can reap nothing satisfactory from your letter of the "Proprietor" of the 23d March. He enlarges upon the slavery question, and passes over, unnoticed, five of the charges alluded to in my letter, stirring up again the old question of the propriety of treating the blacks as slaves. He could not sustain the groundlessness of these "imputations." Why did not he, who took the trouble, inquire into the truth of the statement, that 100*l.* had been promised to the head agent, if a certain produce were obtained for three months consecutively (he would care to admit, that the overseer was promised a reward, as he says that such rewards are usual)? and that the premium of 100*l.* having been gained, the produce fell off, and that no valuable officer of the company, whose character no man can, with truth, impeach, could possibly have been so stupid as to allow himself to be deceived in this manner, filling an important office in the company's employ, had been dismissed from his neighbouring establishment?—and could not the secretary, who appears to have laid down the correspondence to the "Proprietor," have given him the particulars of the Engagers and mechanics who have lately left the establishment? They are stated to be left in disgust. The men are in this country; it is easy to learn their names, to ascertain what caused their desertion, and what they say of the present management of Morro Velho. If they cannot be true, why should we believe the "Proprietor"? or deny their correctness? If what I stated be true, why does he not defend the company on these charges deprecate? My principal reason for addressing you, in the first place, was the paragraph in a "Shareholder's" letter, in your Journal of the 26th of January, referring to the promised reward of 100*l.* to the head captain, if the returns increased a certain amount for three months consecutively. Then this, nothing can be more clear than that the object of the promise was to induce the captain to exert himself on the sinking, driving, and timber work of the mine, regularly every month, and to work the stops fairly (by fair), I mean that the whole range of stops should be worked equally and regularly, from one end of the mine to the other), so that the stamps should be supplied with fair average load stone—the sumps being sufficiently sunk to a stopping ground for the future. I can understand a reward being given to a head captain, for conducting the mine operations with regularity and success, but not to a fellow-countryman, who, in consequence of his dependence upon the company, is beyond his control, if he be honest—in his hands, if the reward were to be paid, the leakage of a water-course might decrease the monthly returns, and no blame attach to him; on the other, by working the best parts of the mine for three months, he might give 100*l.* for himself, at the expense of future returns; it is not necessary to be a lawyer to say this is imprudent. The "Proprietor" takes no notice of this premium of 100*l.* to the head captain, rather abruptly, to say, that paying overseers is contrary to the laws of Brazil. This is, no doubt, true, but how can it be applied to the case of Morro Velho is said to have offered a reward of 12 milreis to the overseer of a department, in which he (the mine agent) had no control, to induce him to give the slaves under charge a greater task than was allotted to them by the officer of the reduction department, under whose orders they were—that, by so overworking the blacks, the head agent should receive the 100*l.* dependent on the produce. This is very different from the case of the "Proprietor." The English correspondent, to whom I gave the name of Silford, said he had been offered the same bribe, but declined it, because he knew his name was quick. The promise of this bribe was unknown to the superintendent. The "Proprietor's" letter composed of three parts—viz.: the correspondence of the head agent's superintendent, relative to the slaves, extracts of a letter from a gentleman, who

**COPPER MINERS' COMPANY.**

COLOMBIAN MINING ASSOCIATION.

It appeared, from a statement read to the meeting, of the working of the mine, that from January to May a profit had accrued of \$1600; but, that on June to November, there had been a loss of \$7357, but the agent held at hopes of better results; at the same time, it was thought advisable to close the concern, and wind up the affairs of the company, which might be accomplished by Midsummer next. A resolution was then unanimously passed, dissolving the company, and authorising the directors to realise the assets, and wind up the affairs of the company, as soon as possible; after which, thanks having been voted to the chairman and directors, the meeting was adjourned.

CALLINGTON MINES COMPANY.

*Dillingham Mines, March 7.*—The vessels with the materials and engine have arrived on Wales in good condition—the house at Kelly Bray is ready for the reception of the party. The underground operations in this part have been very little in the past quarter; small quantity of ores have been broken from the backs, and a few fathoms driven west the 28 fm. level; the lode here is 4 ft. wide, composed of a soft copper, and pench interlocked with black jack, hematite, and stones of copper ores. Having seen a cross-course postoning on the back of the lode, about 15 or 20 fms. to the west of this point, we have had an adit driven from the surface to the south, and the following prospect has been obtained: From present appearances, we do not calculate on any great return from this lode, at the same time we look forward to partial branches of copper ores, just where lode is leaving the gossan. The 70 fm. level is driven about 28 fms. since we have through the great cross-course, the lode in the present end is rather more than 3 ft.—at this time poor; we consider the cross-course, just now spoken of as being seen on surface, is still to the head of us, having seen nothing like it at this level, and have no reason to believe favorable results will soon be obtained. The bearing of the lode is 80° to the south of east. Since the communication has been opened, the two adjacent levels in this part of the mine, we have commenced stoping the back by 12 mns., are aware we had driven through some poor ground within a few fathoms of the cross-course; it is there that we began stoping, and I am happy to inform you, that improvement took place a few feet above the back, so that we have now a regular ore of copper ores from the cross-course to within 8 fms. of the present end; the lode here is 6 ft. wide, and contains about 3 per cent. of copper, or 60 lbs. per ton. We have taken 70 tons in the past month, and calculate on sampling 100 tons at the 50 fm. level has been driven east about 6 fms.; the lode here is 2 ft. wide, intermixed with copper ores; the underlay of this lode by the intersection of the cross-course is much quicker from the 50 to the 60, than from the latter to the 70; this, at first sight, is not so well itself in a favorable point of view, but finding the lode bearing much nearer to the south-east than its general course, we expect soon to find it in its proper position, and the result will rather argue us to the results. The 90 fm. level has been driven east about 25 fms. of the present end, and we are now calculating on this lode being on an extensive scale, the cost will be naturally heavy; it must be borne in mind, that a new mine is being opened, not only at surface, but some considerable depth; at the same time our 90 fm. level being 120 fms. from surface, whilst we have only one level, and this driven but a short distance, from which can be made; we expect the 50 will come some forward to our assistance, in the meantime there is no other thing to be done, but to wait until the next winter, when the necessary expenditure, our returns are not sufficient to cover the expenses of the mine, we have no doubt some, so this part of the mine is fairly laid open, such returns will as we will be satisfactory to the shareholders at large. There are parallel lodes both north and south of the present one, which show some very good indications, and can be to the east of the cross-course at a proper depth for a trifling expense. Soon as the spring advances a little, we expect the water to cease at Kelly Bray, and commence sinking down the shaft, at this point, this object will require less expense, and we shall be enabled to communicate with the lode to the north mine, when we speak under this part in good working condition; had we such a quantity of ground opened, this lode has we have on the lead course, of an average value to the ground driven at the 70, 700 tons per month could easily be raised, and would leave a handsome profit. The 100 fm. level south, at the north mine, is driven some fathoms beyond Kelly Bray lode; the ground here is rather hard, the lode producing work as a monopoly, and the water, which is lower than the lode, is not so good as the ground is more favorable, with a small branch of silver lead once; in this level we first saw silver appear in the lode, with a little lead disseminated through it; in the lower level, we had good branches of silver-lead ore in the sample, this shows a zone before the



## Current Prices of Stocks, Shares, &amp; Metals.

STOCK EXCHANGE, Saturday morning, Eleven o'clock.

Bank Stock, 5 per Cent., 183 1/2	Belgian Bonds, 4 1/2 per Cent.,
3 per Cent. Reduced Ann., 78 1/2	Dutch, 3 1/2 per Cent., 33
3 per Cent. Consols Ann., 80 1/2	Brazilian, 5 per Cent., 88 5
3 per Cent. Annuities, —	Chilian, 6 per Cent., —
3 1/2 per Cent. Ann., 79 1/2	Mexican, 5 per Cent., 147 1/2
Long Annuities, 8 1/2	Spanish, 5 per Cent., 10 1/2
India Stock, 10 1/2 per Cent., 230	Ditto 3 per Cent., 17 1/2
3 per Cent. Consols for Acc., 80 1/2	Portuguese, 4 per Cent., 131 1/2
Exchequer Bills, 1000l. 3d., 42 3/4 pm.	Russian, 5 per Cent., 75

**MINES.**—We cannot announce that a large amount of business has been transacted since our last, and what has been done appears to be in paying mines and others of a legitimate character. We make this observation from the fact, that we frequently hear of shares in sets or companies changing hands, when, upon inquiry, we find that little, if any, kind of mining operations have even been commenced—and at a period, too, when several new adventures are projected, and which are invariably introduced to the public at a premium, with all the promises and assurances of vast profitable results, which the ingenuity of needy or speculating projectors can imagine—whilst, at the same time, shares in permanent dividend-paying mines can be purchased at one-half the price demanded for shares in these new projections. By these remarks, we do not mean to condemn every newly-projected company, proposed for working new ground or suspended mines—for, indeed, there is not a dividend-paying mine in the counties of Cornwall or Devon but had been partially worked, and eventually suspended, at some previous time; but we earnestly recommend the speculating public, before they embarked their capital in new adventures, to make cautious inquiries of disinterested parties, before they parted with their money, lest they separate for ever.

The Treleigh Consols Company held their quarterly meeting on Monday last, when a dividend of 5s. per 5000th share was declared, with a balance of upwards of 1300l. in hand, including the reserved fund. The dividend of 1l. per 256th share in Wheal Treleigh, declared at their last meeting, was paid on Tuesday last. The report is highly satisfactory. There has been demand for these shares during the week, and several transactions have been effected.

At Wheal Treleigh they cut the lode in the 62 fm. level, on Tuesday last, which was found productive, and, with other improvements, will, no doubt, create a demand for shares.

Several shares in Devon Great Consols have been down this week.

Bedford United has much improved since our last, and several transactions have taken place. A large number of Tamars have also been done; and also in South Wheal Betsey (a promising lead mine near Tavistock). South Wheal Francis, Botallack, Levant, and East Wheal Rose, have also been in request, but we are not advised of many transactions. In Wheal Ash, we learn that the considerable improvements which have manifested themselves of late, caused an advance in the price of shares.

Shares in the following mines have been transferred during the week;—viz., Devon Great Consols, Trevelick and Barrier, West Serton, Tamar, Treahne, West Wheal Treasury, West Wheal Tolgus, Caradon Copper, Marke Valley, South Wheal Betsey, South Trevelick, Bedford United, Wheal Mary Consols, Trevelick, Wheal Calstock, Wheal Mary (Redruth). We learn that the share list of the Bangor and Coynton Slate Company is progressing in a highly satisfactory manner; and that a large number of shares have been applied for by parties of the first respectability, who are well conversant with the importance and the importance of the property referred to.

In foreign shares, the business has been very limited—we find that a few Australians, and Real del Monte shares, have been done; but we believe that to be the extent of the market.

Since our last we have to notice the following arrivals of specie—On Monday, the Peninsular and Oriental Steam Navigation Company's ship *Admiral* arrived, with 16 packages of specie, at Southampton. On Wednesday, also, at Southampton, the Royal Mail Steam-Packet Company's ship *Medway* arrived with a valuable freight, consisting of silver bars and dollars on merchants' account, value 518,885; gold coin, gold bars, and dust, value 32,714l.; British coin, value 546l.; and 71 lbs. of platinum, with general cargo of merchandise. We extract the following from the *Times*:—"The vessel *Anna*, arrived in the docks from Oporto, has brought one case of doubloons, individually addressed; the steamship *Columbine*, from Havre, one package of precious stones, and one package of bullion, similarly directed; and the *Royalist*, arrived from Cape Palmas, has brought 4 tons 3 cwt. of Guinea grains, addressed in the same manner. We believe that a large quantity of specie, which was specially imported on Monday, as having arrived by a vessel from Ilay and Callao, South America, comprised nearly 4 tons weight of silver, independently of the gold specie, in ingots, dollars, and other coin, which also comprised consignments of very considerable amount. We believe that a portion, if not the whole quantity brought on that occasion, was destined for the continent; but that its disturbed state caused it to be brought to this country. If this is, as we believe it to be, the case, it is a remarkable proof of the good effect of peace and order. These arrivals, in addition to the simultaneously large arrival of the same nature at the port of Southampton, which was also sent up to the metropolis in the usual official and secure manner, for deposit in the Bank of England, have made an important addition to the already large stores of bullion and specie deposited in that establishment; and which, by recent arrivals, been augmented, if not to an unusually large, at least to a very considerable and important extent." The Peninsular and Oriental Company's steamship *Sulaco* arrived at Southampton yesterday, bringing 40 packages of specie, amounting to 44,892l. 17s. 3d.

**HULL, THURSDAY.**—The market, with the smallest possible amount of business passing, is rather better for the lighter stocks, but anything which requires a fair sum of money is difficult of sale, unless at reduced rates. This is, perhaps, more owing to want of confidence than actual want of money; but it is, nevertheless, the case—people at present seeming inclined to limit their operations to trifling amounts of stock.

## RAILWAY TRAFFIC RETURNS.

Name of Railway.	Lgh. lway.	Present actual cost.	Price per share.	Last Div.	1848	1847
Birkenhead, Lancashire, & Chesh.	15	997,284	37	5 p. c.	£754	622
Caledonian	130	3,594,470	25 1/2	—	3419	—
Dublin and Drogheda	35	754,329	52	—	671	708
Dublin and Kingstown	7	473,282	—	7	1030	960
Dundee, Perth, & Aberdeen Junc.	47	415,078	27	8	787	283
East Anglian (Lynn to Ely)	50 1/2	1,067,432	6 1/2	—	464	612
East Lancashire	24	1,735,915	17 1/2	—	980	612
Eastern Counties	21 1/2	6,259,709	125	4	1148	1005 1/2
Eastern Union	50	979,926	80	—	1121	934
Edinburgh and Glasgow	53	2,375,745	37	6	3318	3089
Edinburgh and Northern	29	953,207	18	—	1188	—
Glasgow, Paisley, and Ayr	64 1/2	2,097,321	85 1/2	7	2010	2319
Glasgow, Paisley, & Greenock	42 1/2	845,554	16	4	947	1004
Great Western	110 1/2	1,876,326	16 1/2	—	215	1177
Great Western	28 1/2	10,970,635	84	7	1785 1/2	1651 1/2
Kendal and Windermere	10 1/2	169,488	23	—	117	—
Lancaster and Carlisle	70	1,395,193	43 1/2	4	1487	986
Lancashire and Yorkshire	124 1/2	7,597,618	66	7	8781	7915
London and North Western	428	21,513,354	122	8	37065	36650
London and Blackwall	4	1,241,061	4 1/2	12	842	819
London, Brighton, & South Coast	151 1/2	6,987,822	27 1/2	—	6319	6219
London and South Western	188	6,264,164	41 1/2	8	7958	6646
London, Brighton, & South Coast	14 1/2	145,135	16	—	—	—
Manchester, Sheffield, & Lincolnshire	46	2,386,024	80	5	2261	1838
Maryport and Carlisle	28	440,851	39	3	625	350
Midland Great Western (Irish)	40 1/2	9,853,122	91	7	18816	17955
Midland Great Western (Irish)	36 1/2	583,776	16 1/2	6	6130	478
Newcastle and Carlisle	69 1/2	1,184,060	10 1/2	6	1517	1560
North British	78	2,800,748	30 1/2	5	1093	1485
Shrewsbury and Chester	17	780,273	15 1/2	7 1/2	709	410
South Devon	29	1,609,071	20	6	885	875
South-Eastern	165 1/2	6,983,181	22	6 1/2	7134	6822
Taff Vale	38	820,065	—	8	1789	1167
Ulster	36	645,211	52	6	857	778
York, Newcastle, & Berwick	142	147,068	—	6	180	—
York and North Midland	230 1/2	4,466,526	28 1/2	9	10111	8925
York and North Midland	230 1/2	3,799,297	61	10	7666	5646

## FOREIGN RAILWAYS

Name of Railway.	Lgh. lway.	Present actual cost.	Price per share.	Last Div.	1848	1847
Amiens and Boulogne	68 1/2	673,398	5 1/2	4	1240	—
Antwerp to Ghent (monthly)	31	—	—	—	—	—
Belgian	57 1/2	—	—	—	—	—
Dutch Rhineish	217 1/2	2,000,000	24	4	10860	10828
Northern of France	107 1/2	—	—	—	—	—
Orleans to Bourges (Central)	72	600,000	32 1/2	4	2435	3000
Paris and Orleans	82	2,011,720	16 1/2	12 1/2	6024	7876
Paris and Rouen	85	2,082,916	11 1/2	11 1/2	2168	5924
Rouen and Havre	59 1/2	—	—	—	—	—
Strasbourg and Bâle (monthly)	88	—	—	—	—	—
West Flanders	—	—	—	—	—	—

Total earnings for last week, £156,475, being an increase of £13,969 over last year.

Month.	Foreign.	English, &c.	Total.
January	£231,400	£4,688,630	£4,920,030
February	132,000	2,160,541	2,292,541
March	1,387,000	1,890,022	3,277,022
April	550,000	1,500,750	2,050,750
Total	£2,250,400	£10,139,943	£12,390,343

character of the lode. The 125 fm. level south, at the south mine, is driven, as you will perceive by the section, to the south of a cross lode; at this time the lode is 6 in. wide, producing silver-lead ore; the air being rather denser here, we have suspended the same until a better ventilation can be produced; this we intend doing by working the lode on tribble, and putting in a shaft for this purpose; in the north end the lode is mixed with silver-lead ore. In the 113 fm. level south we are opening tribble ground; this end is near the intersection of the cross-lode, seen in the level below; in the north end the lode is rather poor—but we have met with branches of fluor-spar in the lode, in the bottom of this mine also; but, so far, have found nothing rich in connection with it. The 100 fm. level north is now in the north part of the channel of elvans—this is sometimes found in one body, at other times separated by a portion of killas; at the points where these parts come together, we find the lode very productive, the portion of killas separating these parts is wider here than in any of the upper levels; in the present end, however, predominates, and of a decomposing character—favorable for bunches of silver-lead ore; the lode is 16 in. wide, work of a fair quality. The 80 fm. level will soon be communicated, which will prove highly beneficial to the ventilation of this mine. The machinery through the mine is in good working order, and our best exertions shall be brought to bear upon the different objects which have a tendency to bring these mines into a more profitable state of working.

## TRELEIGH CONSOLIDATED MINES.

A general meeting of shareholders was held at the offices of the company Old Broad-street, on Monday last, the 3rd inst.

G. B. CARR, Esq., in the chair.

The SECRETARY (Mr. Nicholson) read the notice convening the meeting, and the following mining report from Capt. W. Richards:—

## REPORT.

Your being in possession of the weekly reports, I do not know that I can add much to them. You are also aware that the ground, east of Christoe's shaft, is generally poor, with the exception of one pitch, in the bottom of the 90 fm. level, within 16 fm. of the boundary; and we are now driving the 100 fm. level to come under it. The 110 has so far proved a failure, and we shall, ere long, see the lode in the 120 fm. level. In the 110 fm. level, where I have been driven a considerable distance east and west; and, though we have passed through some good ore ground, they do not look so well as the 80 and 90 east—still we have a good prospect before us in the 60 west, and hope, as we carry forward our deeper levels, they will prove equally good. You are also aware that, in the 100 fm. level, the lode has been disordered by a hard elvan; but, in sinking the shaft (now down 6 fms.) below the 100, the hard floor is leaving, and the lode more regular; we have, within the last few days, cut through it 4 ft. wide, and find some very good ore; and, from this improvement, we may fairly calculate it will prove productive again at the 110 fm. level, where I hope to arrive in about two months, from the present state of the ground. In the Parent lode, our operations have been somewhat retarded by the wet season, not having been able to sink the shaft much below the add; but I hope, in about a month, to resume it. Still I doubt being able to go very deep without the aid of machinery; and, from what we have seen of this lode generally, I think there is sufficient to warrant it. In the last month, we have driven through a very fine-looking lode; and, though it is now divided by a horse of killas, I have no doubt it will, ere long, form again. We are also driving north, at the add, to cut Wheal Orphan lode, which is a south under-lying, and we expect the lodes will come together in about 30 fms. I entertain a very favorable opinion of these lodes. Our returns of late have been limited, in consequence of the very low standard. We have fair reserves of ore-ground on which we could realize, if considered advisable; but I cannot recommend it just now, as we are losing 100l. per month on our present quantity of ore, by the late fall in the standard of copper ore. On the whole, I consider our present prospects very encouraging.

**Treleigh Mines, March 31.**—The 120 cross-cut, north of Christoe's, is to cut the lode west of the shaft. In the 100, east of ditto, the lode is about 15 in. wide, with stones of ore only. Garden's shaft, below the 100, is sinking in the country; we have cut through the lode at the bottom of the shaft—it is 4 ft. wide, of a promising character, with stones of ore; in the 100, east of ditto, the lode is 3 ft. wide, with occasional stones of ore, not so valuable; in the 100, east of ditto, the lode is 4 ft. wide, much altered in appearance for the better, but not much mineral; in the 90, west of ditto, the lode is 18 in. wide, worth 3l. per fm.; in the rise, above the 80 west, the lode is 18 in. wide, worth 4l. per fm.—and suspended for the present; in the 70, west of ditto, the lode is 1 ft. wide, but little ore; in the 60, west of ditto, the lode is about 2 1/2 ft. wide, worth 30l. per fm.; in the rise, above the 60 west, the lode is 2 ft. wide, worth about 5l. per fm.; in the 50, west of ditto, the lode is 10 in. wide, but very little ore; in the add east, on Wheal Parent lode, the lode is 4 ft. wide, split into two parts—the north part of a very promising character, with good stones of ore. The cross-cut, north of engine-shaft, is intended to cut Wheal Orphan lode. The 110, east of Christoe's, is stopped, being poor, and the same men put on the 100 east, on the north or main lode, to come under some ore-ground in the bottom of the 90 fm. level. The 100, south-east on the slide, is stopped, intending to cut a south lode; but, having been driven a sufficient distance, suspended.

The following financial statement, for three months, ending 31st March last, was then submitted to the meeting:—

## Statement of Accounts.

To balance in hand on 31st Dec., in cash and ore bills	£2094 10 5
Copper sold since—December	£773 3 11
January	644 3 9
February	760 14 2—2178 1 10
Total	£4272 12 3
By monthly cost—December	£458 1 6
January	499 1 6
February	444 11 8—1312 6 5
Merchants' bills paid	517 1 7
Lords' dues	129 6 6
Dividend paid	22 10 6
Directors, secretary's salary, rent, advertising, &c.	92 11 11
Balance at bankers, and ore bills in hand	2191 16 0
Petty cash	6 19 10
Total	£4272 12 3

## ASSETS.

Balance in hand in cash and ore bills	£2198 15 10
Ord sold 30th March	£835 11 0
Less dues	52 4 0—783 7 0
Total	£2952 2 10

## LIABILITIES.

Acceptances and claims	£ 663 17 11
Lords' dues—owing	106 12 1
Dividends—unpaid	69 0 0
Contingencies	25 0 0
Total	£864 10 0

(Reserve fund £450.)

The CHAIRMAN said that, from the favourable state of the accounts just read, he had much pleasure in being enabled to declare a dividend of 5s. per share, leaving a balance in hand sufficient to add to the reserve fund 125l., and to cover the expense of removing the engine, &c., computed to cost about 800l.; and, in reply to some questions put to him by the meeting, expressed his confidence in the improved prospects of the undertaking.

Some conversation ensued on the subject of a claim made by the Coventry Bank to 10 shares lodged with them, with other documents, by a Mr. MERRY, as security for his banking account, but which had been mislaid or lost, and, consequently, could not be identified—the numbers not being traceable; when it appeared to be the unanimous opinion of the meeting, that such claim could not be entertained.—Resolutions were then passed, adopting the report and accounts; declaring the dividend payable on and after Monday next; and a vote of thanks passed to the chairman and directors, when the meeting separated.

**DARTMOOR CONSOLS TIN MINING COMPANY.**—At a special general meeting of shareholders, held at the White Hart Inn, Great Coggeshall, on the 3d inst.—EDWARD HOLMES, Esq., in the chair—it was proposed by Mr. JOSEPH BAKER, and seconded by Mr. EDWARD CATCHPOOL, and resolved unanimously, that the minutes and resolutions of the meeting of the 21st Feb. last, be confirmed.—Proposed by Mr. STEPHEN BAKER, and seconded by Mr. JOSEPH BAKER, that the company be dissolved; and that the proceeds of all the saleable effects of the company be applied in liquidation of the company's liabilities—carried unanimously.—Resolved, that a second special general meeting be held at the George and Vulture Tavern, George-yard, Lombard-street, London, on the 17th inst., at 12 o'clock, at noon, for the purpose of confirming the said resolution for dissolving the said company; and that notice thereof be given in the *Mining Journal*, and to the shareholders of the said company.

**WHEAL ANVORE.**—A meeting of adventurers was held at the Queen's Head Hotel, St. Austell, on the 13th March, when the accounts to end of February, showing balance against adventurers (when arrears of calls to this date, 19l. are paid) of 84l. 4s. 6d., were examined and allowed; in addition to which, there is 10l. to 15l. to be paid on account of the deeds of the sett.—It was resolved:—"That from the report given to this meeting by Capt. Hancock, of the Charlestown United Mines (who has this day inspected the mine), and Capt. Glanville, it is considered expedient to prove the course of the lode still further at the surface, especially at the point of intersection from the add level; and that this meeting hereby empowers the committee to adopt the necessary measures to pursue this object, and also to make a call of 10s. or 20s. per share, as they may consider necessary, for the effectual prosecution of the working of the mine, and to liquidate present liabilities."—On the 1st inst., Mr. H. W. Higman, the secretary, forwarded the following report, from Capt. Hancock, dated St. Austell, 1st March:—"In compliance with the resolution passed at your last meeting, I set the men to count the ground, as then agreed on; but finding no lode, I went and examined the shaft that was cleared up by Capt. Glanville, and instead of finding a fine gossan lode from 2 to 3 ft. wide, I found only a branch from 3 to 8 in. wide, composed of iron, gossan, and clay, underlying 10 ft. in a fm., without one particle of ore. I have also carefully examined the other lodes in the sett, which are very poor and unkindly; and, in my opinion, there is nothing in the sett that will warrant the outlay of 1s. more."—The committee, acting on this report, have determined in disposing of the materials, and winding up affairs as early as possible.

**WHEAL RYALTON.**—A meeting of shareholders was held at Pearce's Hotel, Truro, on Tuesday, the 4th inst., when the following statement of accounts was presented:—By arrears received, 57l. 10s.; amount received towards last call, 81l. 10s.; produce of sale, 288l. 1s. 6d.; balance, 99l. 18s.—526l. 19s. 6d.—To balance due last account, 908l. 9s. 6d.; August call, 51l. 9s. 3d.; September ditto, 57l.; merchants' bills, &c., dishonoured, and acceptances by adventurers now bankrupt, 100l. 0s. 6d.; leaves balance, 99l. 18s.—The purser having laid before the meeting a statement of his accounts, giving credit for all moneys received, including the amount realized by sale of the materials—but these still leaving an amount of liabilities of 99l. 18s.—it was resolved, that for

the purposes of liquidating the above amount, a call of 12s. per share be made, and forthwith paid to the purser; and, if not paid within 14 days from this date, he be, and is hereby, authorised and empowered to take legal proceedings against defaulters, for the recovery of their respective amounts.

**WHEAL CALSTOCK.**—At a meeting of adventurers, held at the office, Old Town-street, Plymouth, on Tuesday last—J. L. COLLEY, Esq., in the chair—the accounts were produced, showing balance in hand of 2l. 11s. 7d.—they were passed, and a call of 1l. per share made. We shall give the particulars of the accounts, and the agent's report, in our next.

**THE MAESTEG IRON-WORKS.**—We regret to state that the Maesteg Iron Company, the blowing out of whose furnaces we noticed last week, and by which 300 or 400 men were thrown out of work, have become bankrupt, a fiat having been opened against them in the Bristol District Court of Bankruptcy. The firm consists of several partners, and their liabilities are between 100,000l. and 200,000l. The assets at present cannot, of course, be correctly ascertained, but it is stated that they are estimated at between 60,000l. and 70,000l., subject to a deduction for mortgages amounting to about 20,000l. The Maesteg Company were, it appears, in the habit of making advances to the Vale of Neath Brewery Company, which has stopped payment, and they now hold about 40,000l. of the bills of the Brewery Company. Mr. E. M. Miller has been appointed the official assignee to the estate.

**BODMIN ELECTION.**—The select committee appointed to inquire into the allegation of the petitions, presented to the House of Commons, against the return of Messrs. Lacey and Wyld, concluded its labours yesterday, by unanimously passing the following resolutions:—That H. C. Lacey, Esq., and James Wyld, Esq., are duly elected burgesses to serve in the present Parliament for the borough of Bodmin; that a practice prevailed at the last election, and has prevailed at former elections, of issuing refreshment tickets of the value of 5s. each; that it is not proved to the committee, that at the last election such refreshment tickets were issued with the knowledge or consent of the sitting Members, or their agents; and that the committee see no reason to give costs in respect to any matter arising out of the present proceedings. The sitting members, who were present, were warmly congratulated by their friends upon the favourable termination of this protracted inquiry.

## ACCIDENTS.

**Davies's Colliery, Aberdare.**—On Friday last, three men were very severely burnt; indeed, so seriously have they been injured, that the life of one of them is considered to be endangered, and the others are not likely to recover for some time.

**Deadfall Death.**—J. Jones, aged 63, met with his death in one of the Dowlais pits.

**Hart's Hill Colliery, Brighthelm Hill.**—W. Clarke was seriously injured by a fall of coal, which became detached, and completely covered him in its descent.

**Hay Green Colliery.**—As R. Cook and a companion were ascending the pit in a skip, the chain broke, and precipitated the poor fellows to the bottom.

**Yew Tree Colliery, Kingmoor.**—J. Copnagh was killed by a fall of coal.

**Methyry—Deadly Fatal Accident.**—As John Jones, aged 63, was engaged at the top of one of the Dowlais pits on Friday week, he became entangled in the rope, which had the horrid effect of severing his head from his body, and throwing it a distance of 27 yards, and otherwise dismembering his body, so that it had to be carried home in a sack.

**Another Explosion of Steam-Boat.**—On Saturday morning last, an explosion took place on board a foreign vessel in the docks, laden with Methyry coal, by which much damage was done to the vessel, and two men and a boy much injured—the boy sustaining a fracture of the arm. It is to be regretted that people will not learn wisdom by experience—that masters of vessels who take Methyry coal on board, will not use the precaution of leaving the hatches open for a short time after the cargo is put on board, by which all danger would be obviated.—*Swansea Herald.*

**The Colliery Explosion near Neath—Discovery of Twenty Bodies.**—The explosion which occurred at Eakyn's Colliery, near Neath and Brittonferri, on Wednesday week, proved, we regret to say, of a more appalling character than was represented—upwards of 20 human beings having been hurried into eternity. The colliery was worked by Messrs. Penrose and Evans, and is situated at a distance of 1 1/2 mile from the town of Neath, in Glamorganshire. It appears that, on the morning in question, a considerable number of colliers entered the works, as usual. The men are not let down to this colliery by means of a basket through a shaft, but walk down an incline, or drift, in the side of the hill, which leads to the interior of the works. This drift extends about 250 yards, in a straight direction, after which it diverges to the south. In the turning, or deviation, which extends about 20 yards, there are several stalls, in each of which three, four, or five persons work. The precise number of men at work on Wednesday we have not heard, but we believe there were about 30, which is considerably below the usual numbers. Soon after three o'clock in the afternoon, the inhabitants of the neighbourhood were alarmed by a loud explosion. It was at once inferred that some catastrophe had occurred, and, when they found that their worst fears were founded, they hurried to the scene. The colliery was violently shattered, and various portions of the plant







## NOTICES TO CORRESPONDENTS.

It will at all times be much trouble, and frequently considerable delay, if communications are simply directed—  
To the Editors,  
Mining Journal Office,  
25, FLEET-STREET, LONDON.

Also, to avoid trouble, Post-Office Orders should always be made payable to WILLIAM SALMON MANSFIELD, as acting for the proprietors.

"A" We should feel obliged to all persons, captains, or adventurers, to forward particulars of meetings, &c., of the mines with which they may be connected, on the earliest opportunity, that they may be published in the Journal with as little delay as possible.

RECENT DISCOVERIES IN ELECTRICITY.—We have received a long letter from Mr. Isaac Bagges, in reply to Dr. Murray, in last week's Journal. The crowded state of our columns would prevent us inserting so lengthy a controversial epistle—entering so minutely and logically, as it does, into all the points advanced by the Doctor—but, we think, our correspondent will have no cause to regret its omission, as it would be sure to elicit a reply, and the dispute thus, perhaps, be provokingly prolonged. We shall, however, be happy to afford space for the papers promised by Mr. Bagges, in which he intends entering fully into the details of the discoveries in electricity—the reference to which has occasioned the late correspondence between him and Dr. Murray.

"A Miner" (Leeds) should address his letter to Dr. Clanny, Sunderland, who, doubtless, will forward him the particulars he requires.

"W. R." (Bath) is informed, that all the information we have on the subject appeared in last Journal.

"A Subscriber" (Wicklow).—The Numbers are out of print, and we know of no means of procuring them.

MINERALOGICAL NOMENCLATURE.—Sir, An author, named Allan, published a book in Edinburgh, 1814, entitled *Mineralogical Nomenclature*—alphabetically arranged, with synoptical tables of the chemical analyses of minerals—second edition. I should feel obliged if some one of your readers would inform me, if there be any later edition, or any similar work published, of a more recent date?—Or if they could recommend me any good author on chemical nomenclature in general.—Yours April 5.

We must impress upon our correspondents, the necessity of invariably furnishing us with their names and addresses; not that their communications should, consequently, be noticed, but as an earnest to us of their good faith.

The MINING JOURNAL is published at about Eleven o'clock on Saturday morning, at the office, 25, Fleet-street, and can be obtained, before Twelve, of all news agents, at the Royal Exchange, and other parts of London.

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USED IN ENGLISH AND FOREIGN MINING DISTRICTS.

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## THE MINING JOURNAL.

Railway and Commercial Gazette.

LONDON, APRIL 8, 1848.

It was both our hope and our opinion, that the electric clouds, which, for some weeks past, have been flashing all over Europe, had nearly spent themselves, or were rolling off into distant and unknown regions; but we regret to say, that if there is no actual organisation, there is no appreciable abatement of the storm, which has surprised and affrighted the south-western districts of Europe. A movement in the political element of Christendom, so extensive and so profound, is without a parallel since the age of the Crusades—when, beneath the tyranny of a more excusable fanaticism, the loose population of continental and insular Europe rushed eastward to the rescue of the Holy Sepulchre, as now the loose population of the continent is everywhere rushing throneward, to pluck from sovereigns the sceptre of their power. There is one lesson which the circumstances and the occasion must not fail to teach kings, and all who may be continued in authority—that Government exists chiefly, if not wholly, for the benefit of the people—that the classes who do the drudgery, and accomplish the laborious tasks of the commonwealth, are just those whose convenience and accommodation must be more extensively consulted—that they must enlarge and liberalise the ground plan of the political edifice, if it is ever to bear safely the pressure of the superincumbent masses—that the doors, in fact, of the national hive must be widened, in order that the crowds of working bees may everywhere go in and out, and find pasture. In presence of this almost universal fever, it was in the nature of things that trade and commerce should be hurt and impeded; but, we are happy to say, they are making progress in spite of their hindrances, and rallying notwithstanding their wounds. The best judges have felt, from the first, that the checks which the ordinary business of the kingdom had to encounter, would be but transient; and we are happy to learn, that the trade circulars of the great houses in the north and manufacturing districts of England, justify us in looking to a fair spring and summer trade. We think it also highly probable that there will be a considerable increase in the railway expenditure, on the absolutely good and necessary lines, during the open months of the approaching season. The circumstances of the country and of the continent, make it a matter of policy, as well as of profit, that all practicable means be adopted to employ the masses of our labouring population. Mining occupations continue steady and progressive. It is not open, as a separate interest, to those extremities of ebb and flood, which disturb other departments of the commercial ocean. It is yielding now, as for a long period it has done, an amount of remuneration to those holders as a body, which will bear comparison with the most productive and profitable works which make up the resources of this great country—resources, it should also be observed, which, shedding their first and cheapest influences at home, then spread their wings in other climates, and distil their dews on every land to which the genius of Britain obtains access, or of which her power maintains the occupation.

With reference to the important passing events on the continent, it would seem Austrian control cannot be resumed in Italy, with a chance of subduing the national feeling, excited with the Pope at the head of the movement. We hear of the Neapolitan troops, under General Pepe, being en route for Lombardy—so that the forces of Sardinia, Tuscany, Rome, and Naples, will be united in resisting the return of Austrian rule in Lombardy. Venice will co-operate with the Lombards in the future form of Government to be decided upon; and it would appear, the Duke of GENOA (second son of the King of SARDINIA) may, as the probable King of LOMBARDY, federate with Tuscany, Rome, and Naples. The elections of the superior officers of the National Guard in Paris are going on with considerable opposition to the ultra Republican party, and Monsieur LOUIS BLANC's theories are becoming manifest to the more thinking portions of the operatives, so as to promise the present excitement in Paris will work its own cure.

If the Danish and Prussian affair, with regard to Schleswig-Holstein, settle down as it was hoped, although now we fear scarcely probable, into an amicable understanding, the Emperor of RUSSIA will hold to the tenor of his proclamation, and confine himself to the protection of his own territories. The principal question at issue, then, will be the future position of Poland, which will mainly depend upon the views that may arise upon the state of that country by Germany, or France, after the United German Parliament, and the French National Assembly, are respectively elected.

There are no political differences to this time, nor are any apparently probable, to involve England in continental disputes, which, in the course of a short time, may now be sufficiently settled, to relieve commerce from its temporary derangement.

By private advices, received from the mining districts in Germany, we are sorry to observe, that a general depression and stagnation has occurred there, and in all public works. Although the several nations are satisfied with the concessions granted them by their sovereigns, yet the apprehensions of a war in Holstein, and

the late events in Lombardy, &c., have been productive of a general feeling of insecurity. Some establishments have been entirely stopped—several partially—many of the workmen in the north of Germany having turned out to join the volunteer corps, being formed to assist the Schleswig-Holsteiners in their struggles with the Danes; it appearing almost inevitable, that a war must commence between the belligerent parties.

All State paper money has depreciated in value, and railroad debentures (Eisenbahn Cassen Schien), which were of the value of 40 schillings current, are refused by every one. The directors of the railroads have placarded on their stations, that they refuse paper money in payment of their fares. As an instance of the general feeling of insecurity which prevails, we are credibly informed, that four towns in North Germany, which were on the point of concluding contracts with English engineers to erect gas-works, and subscribe the capital themselves, have withdrawn, and decided that the engagements should be in abeyance till more peaceable times; and we can venture to predict, that the metal trade will suffer as great a depression in those quarters as any other. In no speculation has this evil been more remarked than in railroads, which is mainly to be attributed to the late events in France—speculators fearing to invest capital in them, imagining, that in any *emée*, their property will be the first to suffer. We do not wish to be augurers of ill omen; but we cannot but believe, that this alarming state of affairs must have a bad effect on our trade with the German market. Great quantities of coal, coke, and iron—not to mention other metals—are annually shipped to Hamburg and Bremen, and from thence circulated through Germany; and a decrease of our exports to these ports must materially affect those trades, and react on our own manufacturers and mine proprietors. Should, however, this not be the case—and we trust that it will not be so fearful as at present we have ground to believe it will be—we would advise those accustomed to trade with Germany, to be cautious in their consignments, as in these changeable times, we have seen it is impossible to discern what the coming day may bring, or who may be involved in misery and penury.

Just as we had concluded the above remarks, further information reached us, by which our fears, as to a collision between the Danes and Holsteiners, were confirmed, war having commenced in Schleswig. According to the *Bremer Zeitung*, sharp firing of artillery and musketry was, on the 31st of March, heard in the direction of Schleswig or Eckenforde. At Apenzade, there are stationed two Danish steam boats and a brig of war, which have captured the steamer *Christian the Eighth*. It is reported, but not authenticated, that the Danish war steamer, *Hecla*, had been boarded and taken by the students of Kiel, and some riflemen. In the meantime, the Danes are resolved not to lose Schleswig without a struggle; the greatest enthusiasm and determination to keep the Danish kingdom entire prevails in Copenhagen, and all the provinces. Nearly all the shopkeepers there have enrolled themselves as volunteers.

On Thursday evening, "a bill for amending the law for the leasing of mines in Ireland," was read a third time in the House of Commons and passed. The change which this bill effects in the present law is, simply, that mining property held in trust for minors, idiots, or lunatics, or by the possessors of glebes and other church property, may be leased for 41 years, instead of 31; and the rent, formerly restricted to one-tenth of the gross produce of the mine, is left unrestricted to the terms which may be agreed upon by the parties. The new bill, in destroying the restriction upon the rent, confers a most inestimable benefit upon the mining and labouring interests of Ireland. This may be illustrated by the fact, that the Knockmahon Mines, worked under a lease, granted by the trustees, under the marriage settlement of the lady of Mr. R. BERNAL OSBORNE, M.P. for Middlesex, would become almost useless under that provision, by which one-tenth of the gross produce is claimed as rent, on account of the great depths, and consequent great expense, at which its operations must be in future carried on.

Under the bill now passed, the lessees may be able to renew their agreements upon such terms as will enable them to keep their important works in activity, keeping a large number of the population in employment, and realising themselves a fair interest for the capital employed. There is, however, one omission in the bill—the remedying of which, at the remonstrance of Mr. WYLD (now the undisputed Member for Bodmin), the Government pledged itself should not be opposed in the other House. It is that, while the present occupier of glebe lands is permitted to lease the metalliferous produce beneath the surface, no reservation is made of the rights of his successor. It is obvious, that a piece of glebe land, leased for mining purposes, may become at the surface, by the necessary mining operations, a complete waste; and, the lease being expired, the endowment of the living, as far as that glebe is concerned, may be a nonentity. In England, the law insists that five-eighths of the profits of a lease of glebe land for mining purposes, shall be invested as a *corpus*—the interests of which will be payable to future incumbents, as well as to the one in possession. The adoption of this regulation into the present measure for Ireland, will be proposed in the House of Lords by the Right Rev. the Lord Bishop of St. DAVIDS; and, opposition to it being deprecated by the Government, it will, doubtless, be carried. On the whole, this may be considered an instalment of those remedial measures promised to Ireland for the encouragement of her industry, and, no doubt, can be entertained, with these amendments, of its producing a beneficial effect upon her mining prospects.

Considerable surprise having been excited by the difficulties recently experienced by the VILLE MONTAGNE ZINC COMPANY, and the consequent depreciation in value of the shares in that concern—a concern until now so eminently successful, as to occupy the highest place in public estimation—it may be, therefore, interesting to trace some of the principal causes which have led to such an unexpected event. It appears that this company is possessed of a very extensive range of mining territory—so extensive, that it not only served for the supply of their own magnificent works, but enabled them also to sell large quantities of calamine to other establishments, which are dependent upon them for such supply. The smelting-works belonging to this company are on a grand scale, and are erected at Liege, while their rolling-mills are established in France—thus, singularly enough, they raise their ores in Prussia, smelt them in Belgium, and roll the metal into sheets in France—incurring, by such arrangement, a triple risk of interference, as any political disturbance in either of the three kingdoms was likely to affect themselves. The object in view, in conveying the ores to Liege, appears to have been for the facility of obtaining coal; and that which induced the erection of the rolling-mills in France, the evasion of a heavy import duty on sheet zinc, while zinc in cakes is allowed to go in on payment of a comparatively light impost. This arrangement had, however, one manifest inconvenience—it led to an entire dependence on the French market alone for disposing of their produce; this market is now extinct, and their mills stopped—at least for the present.

This is, however, not all—for they have hitherto been so exceedingly successful, and have become so intoxicated with good fortune, as to repose in a dangerous security; the consequence has been, such as often happens, that they have been caught napping—their reserve fund having been incautiously expended in a different manner from what was contemplated, or which its name implied, was laid out in the extension of mining operations and the increase of works; and, when required to sustain the credit of the concern, it is found wanting. It should not, therefore, excite surprise if, after

sustaining so severe a shock, they may have been compelled, in some degree, to yield to the storm; yet they have the consoling consideration, that their reverse has not arisen from any general previous depression in the zinc trade, nor from any fault or disability in their works, but solely from the failure of the accustomed returns from their usual market.

Meanwhile—and notwithstanding their difficulties—the assets of this company, without reckoning their mining grant, exceed their liabilities by upwards of 80,000*l*. As to the worth of that grant, it is estimated by all competent judges, as well as by financial men, to be of at least 1,200,000*l*. sterling—so rare on the continent are the productive mines of calamine, and so large the returns to be derived from smelting-works for the reduction of these ores. The effects of these difficulties, arising as they do from incautious measures, do not, unfortunately, rest with themselves alone; but are, at this moment, seriously felt by all others who are engaged in the production of zinc—inasmuch as the sudden diversion of their large manufacture from its original course, combined with the urgent necessities of this company, obliging them to force sales, has put down the price very considerably—the markets both in England and America being suddenly overwhelmed by this unexpected influx.

It is to be hoped that commerce must, before long, resume her usual channels, and the markets be restored; yet even the present price for zinc, although under what any English smelter can produce that metal for, is still a good and remunerating one for some parts of Prussia, where there exists unusual facilities for its profitable and extensive production.

When, in the autumn of last year, the question of the national defences so generally engaged public attention, we suggested the importance, before everything else, of strengthening and perfecting the force of our steam navy; all subsequent events, and the fuller public examination of the subject, have confirmed this view of our duties. Added to other governing considerations which surround the subject, we are furnished with motives for adopting this method of defence, when its efficiency, its mobility, and its peculiar adaptation to the genius of our people, is justly estimated.

If the question of naval supremacy, or of national independence, is to be settled at sea, what other element of public strength is so likely to contribute to an auspicious settlement of these questions, as a steam armament, everywhere commanding the seas which girdle these imperial islands. Moreover, though a permanent, it is not a stationary force—its locomotive capacity is one of its leading recommendations. If the strength of our arms is to be tested, no matter where, in the Baltic or within the pillars of Hercules, eastward in the old continent, or westward to the new, a steam armament can be run off in any direction, and at any time, which may best suit the exigency and the occasion. It suits too, admirably as we think, the historical and the actual tastes of our population. A steam fleet rushing seaward, and directly to its object, is one of the most attractive nautical objects which the British eye can dwell upon. The cultivation of this branch of the naval service of the country, is a duty which, under the present circumstances of the world, we cannot, except at infinite peril to ourselves, neglect. In arts and exercises of this, and of a connate character, we have had a not inglorious reputation, since the days of PHILIP I. and of the Armada. Shall we slacken in our devotion to them, at a moment more pregnant and more lowering even than that? If we are in arms at all, let us be seen again, as we were seen on that memorable occasion, and realise the poet's declaration:—

"Britannia needs no fortress high,  
Nor towers along the steep;  
Her strength is on the mountain wave,  
Her home is on the deep."

If the fermentation now prevailing—if the complicated relations of the courts of Europe should, after all, receive a pacific solution—we shall set it down as one of the greatest of recorded miracles; but the imprudence of calculating on a contingency, so desperate and improbable, is too clear, on the face of the circumstances, to require an observation. On the other hand, if the new and adverse interests, which are daily springing up, point to war somewhere, as their necessary exposition, by what means can we hold our place, and vindicate the integrity of our shores, more economically, or more efficiently, than by an augmentation of our strength at sea, and especially of our floating steam-power?

GOVERNMENT CONTRACTS FOR COALS.—The Admiralty Commissioners have given notice that, on Tuesday next, they will be ready to treat for the delivery, at the under-mentioned stations, of the following quantities of coals for the service of her Majesty's Mail Steam-Packets:—Dover, 5000 tons; Holyhead, 2500; Kingstown, 1400 tons, to be delivered within 12 months from the 1st of May next; also for supplying at Port Patrick and Donaghadee, for the like service, during the said period of 12 months, all such quantities of coals as shall, from time to time, be demanded. The coals for Donaghadee to be supplied by the contractor for Port Patrick. Contracts will also be entered into on Thursday, the 20th inst., for the supplying of coals at her Majesty's dock-yards of Deptford, Woolwich, Sheerness, Chatham, Portsmouth, Plymouth, Devonport, and Pembroke, and the Admiralty and Marine Offices.

ENGLISH COAL COMPANY IN FRANCE.—A company has been formed, under the name of M. Latour Landarthe, for the purchase in England of coke and coal, particularly that description most suitable for the making of coke for railways, furnaces, &c., especially on the banks of the Loire and other departments, where manufactories of every description abound. A partner, or director, of the company is at present in the north of England, making arrangements with some of the large colliery proprietors for supplies, as there remains no doubt that the demands for British coals in France, when the duties are reduced, will increase to a considerable degree, as it is now becoming very general, not only in the manufacturing districts, but for private consumption.

CONTRACTS FOR COALS FOR INDIA.—The Court of Directors have given notice, that the Finance Committee will be ready to treat, on Wednesday, the 19th inst., for the supply of 3000 tons of coal, to be delivered at Aden, on the southern coast of Arabia, of the following descriptions:—West Hartley, Carr's, Buddle's, Davison's West ditto, Hartlepool ditto, Stewart's Wall's End Steam-Coal, Glasgow Hardspit ditto (screened), and Risca Black Vein (handpicked); also for their different military establishments in this country.

COAL IN WESTERN INDIA.—We learn by the late despatches, that the efforts of the Indian Government to discover coal within the districts of Western India are likely to be successful. The search had been entrusted to Mr. Johnson, civil engineer, who, under the guidance of Mr. Hamilton, the resident at Indore, proceeded to examine the coal formation in the neighbourhood of Ninnar. Some specimens of that coal had been sent to Bombay, and proved to be of a good quality. It was hoped that means could be devised for conveying these coals by the Nerbudda to the sea.

THE COAL TRADE.—The collectors and comptrollers, and other principal officers of the Customs department, and at the several ports and places throughout the kingdom, have received a communication from the commissioners, through their secretary, stating that he has been directed to transmit to them a copy of an address from the House of Commons, for an account of local or municipal dues on coals imported into, or exported from, any part of the United Kingdom, and to direct them to collect the particulars required, so far as they relate to their respective ports, from the municipal authorities, or rather parties competent to supply them; and, when collected, to transmit the same to the Inspector-General of Imports and Exports, with the least possible delay; and that, in the event of their experiencing any difficulty in carrying into effect the directions thereby given, they are forthwith to report the same to the board, and to point out the quarter to which a direct communication from the Lords of the Treasury may be necessary, for the purpose of obtaining the desired information. The following is a copy of the resolution of the House of Commons alluded to:—Resolved—That a humble address be presented to her Majesty, that she will be graciously pleased to give directions that there be laid before the House a return of all dues, duties, and taxes, municipal, local, or imperial, levied on the importation of coal or coke into any of the ports of the United Kingdom, or from any other ports therein, stating the amount so collected in each port, in the years 1846 and 1847 respectively. Also the dues, duties, and taxes, municipal, local, or imperial, levied in each of the above years, on the exportation of coal and coke from any port of the United Kingdom, either coastwise or foreign, with the amount so collected in each port. Also, a similar return of taxation on all coal and coke brought by railway to any part of the United Kingdom, or from any other part of the United Kingdom by railway, with the amount thereof.







has, however, the disadvantage of giving off considerable quantities of a greyish smoke during the whole time of its burning.

**DALKEITH CORONATION SEAM—DALKEITH JEWEL SEAM.**—The experiments on these two coals were repeated, from the circumstance of their having been tried in the first instance when the brickwork of the boiler was still damp, which circumstance must necessarily have interfered with the results obtained. During our experiments it was observed of both these coals, that they are lighted easily and burn freely without the production of much smoke. They also required little stoking, and left but an inconsiderable quantity of incombustible matter.

### The Metallurgical Treatment of Ores.

(Continued from March 25.)—No. XV.

The matt, or regulus, produced, as described in our last week's Journal, is submitted to six successive roastings, in spaces surrounded by three walls. The length of these walls is 6 feet, the breadth 3 feet, and the height 5 feet, and the hearth is very much inclined towards the open side. On this is placed a bed of wood, as a base, and then alternate layers of matt and charcoal. The whole is covered with powdered charcoal, which, as it burns, is replaced by the fragments of half-roasted regulus, which fall from the bottom of the hearth. At each charge are roasted about 60 cwt. of regulus, and the six roastings, all performed in the same manner, last about 51 days. In these successive roastings, a small quantity of sulphate of copper is always formed, which is extracted by washing, and the liquid so obtained is evaporated in leaden vessels, to the point of crystallisation. When the regulus has undergone desulphurisation—which is, however, very rare—it is transformed into deep red, very magnetic lamellar masses, containing, according to Berthier, protoxide of copper, 73.0; deutoxide of iron, 13.8; earthy matters, 13.8=99.6.

The regulus thus prepared undergoes a new fusion in a slag hearth, having mixed with it about a fourth of its weight of poor slag; 100 parts of regulus give from 30 to 40 parts of black copper. Besides this, about 16 parts of poor matt are obtained (this occurs from the small quantity of sulphur remaining after the roasting of the first regulus), and a slag, which is fused with a new portion of regulus.

The following is the composition of the slag:—Silica, 33.6; lime, 5.0; protoxide of copper, 3.0; protoxide of iron, 51.5=98.1; these slags are compact, black, and magnetic. The regulus, which swims on the bath of black copper, is in thin plates, of a semi-metallic blackness, has a crystalline fracture, and is mixed with a very considerable quantity of small grains of red copper. The following is its analysis:—Sulphuretted copper, 65.0; sulphuretted iron, 25.3; metallic copper, 8.0=98.3. The above substance is re-roasted with a fresh quantity of slag, to the point of crystallisation, the black copper, it has a dull red appearance, acts sensibly on the magnet, and is constituted thus:—Iron, 3.5; sulphur, 0.66; silver, 0.49; copper, 95.4=100.0.

M. Berthier, to whom the above analysis is due, could not detect the slightest trace of cobalt or nickel. It is the black copper thus obtained that is further treated for silver. The method which is employed at Mansfeld entails the use of lead, whereby silver-lead is produced, and the silver separated by cupellation, as already described. We shall examine this mode of treatment, with some degree of minuteness. The information necessary for the elucidation of this important process has been collated from the memoir of M. Mansfeld, of the Habsburg Mills (*Annales des Mines*, vol. ix.), and from that of M. Karsten, of the Neustadt Mills (*Annales des Mines*, vol. xi.). We shall first give the operations in detail, which make up this complicated process. The duration of which, from beginning to end, is about three years:—

1. Breaking the black copper into suitable fragments for the following operations:—

2. Preparation of the black copper for liquation, by fusion with lead. During this operation a small quantity of slag forms, which is added to the next fusion of a similar kind.

3. Liquation of the alloy produced in operation 2. In this operation, by the ready fusibility of lead, and its great affinity for silver, we have formed, on the one hand, silver-lead, and on the other residual copper, which is yet argentiferous—a slag is also obtained.

4. Cupellation of the silver-lead, in which, as already explained, the lead oxidises, and passes off as litharge, whilst silver remains on the cupel.

5. Refining the silver produced in last operation.

6. Treating the silver-lead, the copper residues of No. 3, in order to separate the last portions of lead and other matters.

7. Refining the pigs (ingots) of copper obtained in 6: in this operation fine copper and a slag result.

8. Fusion of the slags and dross: in this operation the substances treated are part of the slags of No. 2 and of No. 3—litharge, cupel bottoms, and, lastly, all the metallic waste of the mill. By this fusion we obtain poor metal for liquation (No. 3), which is liquated, furnishes a silver-lead, which may be employed in operation 2; and rich slags, which are refused four times, with the production of a very poor slag, which is rejected as worthless.

9. and lastly, The fusion of the dross produced in the refining operation, which furnishes copper, to be treated as Nos. 6 and 7.

The division of the masses of black copper is thus effected: sharp-pointed stampers are first used—these separate into fragments, the more brittle portion, those parts which withstand this treatment, are heated and broken up on an anvil by hammers. This accomplished, the fusion with lead is thus performed:—Sometimes this takes place in a slag-hearth—sometimes in a reverberatory furnace. In the slag-hearth, the necessary quantity of copper to form one liquation, black, or pig, is heated to redness; when it begins to fuse, lead is added, and soon after the quantity of copper for another block. Although no flux is added during the fusion, a small quantity of slag is formed, doubtless, from the sides of the furnace—the ash of the fuel employed, and some of the metal oxidised during the operation. The mean composition of the slag is as follows:—Oxide of lead, 63.2; protoxide of copper, 5.1; protoxide of iron, 6.8; alumina, 4.7; silica, 20.1=99.9. Nearly all the bases exist as bi-silicates.

When the operation is performed in a reverberatory furnace, a quantity of copper, proportioned to its size, is first fused, then the necessary quantity of lead is added. The latter metal immediately enters into fusion; yet it is necessary to strongly heat the alloy for some time, to reduce it to a very liquid state; it must also be continuously stirred in every direction, to render it perfectly homogeneous. One operation produces from 8 to 11 liquation ingots, according to its size. The ingots are run into the form of circular discs, 24 to 26 inches in diameter, and 3 to 3½ inches thick. They weigh from 3½ to 3½ cwt. each. These dimensions seem to be the best for separating the greatest possible amount of lead, and carrying off the smallest amount of copper. The alloy must be very rapidly cooled, by dashing water over it, so as to preserve its homogeneity; but, nevertheless, the upper part generally contains most copper, and the under part most lead.

The proportion of lead to be added to the copper is very important; for it can be readily conceived, the less there is used, the less will be the resulting loss; but, at the same time, more silver will be left in the copper. Long experience has shown, that the ingots must contain at least 500 times as much lead as silver—better much more; and from 10 to 11 of lead to 3 of copper. It is remarkable, that the last relation is nearly that of the equivalent numbers of the two metals.

The best proportions seem to be—copper, 100.0; lead, 350.0; silver, 0.7; from which it follows, that copper containing more than 7-1000ths of silver, cannot have the whole of the latter separated by one liquation. On the other hand, when the copper is very poor, it is enriched by the addition of silver-lead. The liquation ingots contain, according to M. Karsten—silver, a variable quantity; copper, 21.43; lead, 78.57=100. It is upon this tertiary alloy that the operation of liquation is effected—the operation consisting in raising the temperature of the alloy to a point, at which the lead, fusible at the temperature of the furnace; the other, with excess of copper, which is infusible. This division only takes place at a certain temperature, above which the primitive alloy is re-formed; from whence we ought to conclude, that it is wrong to very strongly heat the ingots, towards the end of the operation, to separate the last portions of silver-lead; but that it would be preferable to prolong the operation at a lower temperature. It is easy to see that this operation requires the greatest care on the part of the workmen; it ought to be so conducted as to have the least possible contact of air—an equally distributed temperature, which must not be so high as to cause fusion; it is for these reasons that all attempts to use reverberatory-furnaces have failed. These general principles are very readily understood by comparing the results obtained by M. Karsten, who has examined the composition of the fusible alloy at various epochs of its formation. The alloy, which runs during the liquation (silver-lead), if the above principles are true, ought to have the same composition at the commencement as at the end of the operation. The following are the results of M. Karsten, who examined the composition of seven samples, taken at as many different times, during the course of the operation:—

	1.	2.	3.	4.	5.	6.	7.
Lead.....	97.3	97.9	97.3	97.6	97.2	97.8	97.3
Copper.....	2.7	2.1	2.7	2.4	2.8	2.2	2.7

They all contained from 5-12 cwt. of silver per 100 lbs. to 5-4 cwt., in the same quantity. The same chemist has proved, that the infusible alloy, at the heat of liquation, presents also a tolerably constant composition: he analysed samples collected, at five different operations, made at Neustadt:—

	1.	2.	3.	4.	5.
Copper.....	67.1	68.6	70.2	73.1	75.2
Lead.....	32.9	31.4	29.8	26.9	24.8

From these experiments, M. Karsten is led to believe, that of these two alloys, which separate—the one contains 12 atoms of lead, and one of copper; and the other, 12 atoms of copper, and one of lead. The following facts support this supposition, and which are difficult of explanation, if it is admitted, that the lead and copper mix together, and that, for instance, after running two pigs for liquation—one to be cooled very rapidly, by throwing water upon it; and the other, on the contrary, to be cooled very slowly—it will be found, if both be broken after cooling, the first is perfectly or nearly homogeneous; and in the second case can be distinguished two alloys—the one in red grains, and the other grey. On the other hand, when the infusible residue of the pigs, which have undergone liquation, are mixed with water, in order to wash them, which they may be rapidly removed from the furnace, it is remarked, that these which are heated to a certain degree of redness, allow an alloy of lead and copper to run from them, which contains 2-3 parts of copper, like that produced during the liquation; whilst those which are too cold, and those which are too hot, do not furnish any. The explanation of this is very simple; when too hot they give no more, because they contain a perfectly homogeneous alloy, which, by contact with cold water, immediately becomes solid, but whilst they are hot, and soft, the separation of the two alloys takes place, and the cooling which takes place forcibly contracts the infusible alloy, and forces that which is still liquid to exude in drops. The operations which remain to be described have, for their purpose, the separation of the silver contained in the silver-lead produced by liquation as above, and that contained in the residual matter of liquation. The treatment of silver-lead, and the refining of the silver produced, has already been fully discussed; we will, therefore, pass on to the method of working the infusible alloy produced by liquation. The first operation which undergoes is technically called the sweating process. The sweating furnaces contain from 200 to 300 cwt. of the liquated pieces; the operation lasts from 25 to 36 hours, and is divided into several periods. In the first, which lasts from five to six hours, they are heated by the application of a gentle heat, so as to avoid fusion; by this a certain quantity of silver-lead exudes. In the second, lasting from 9 to 10 hours, they are heated more strongly, and the doors of the furnace opened, so that air may come in contact with them. They soon become covered with a layer of oxide, which fuses off, and runs on the hearth. When the production of this oxide nearly ceases, the doors are shut, so as to exclude atmospheric air; and the third period, which lasts from three to four hours, commences. The temperature sinks, the oxidised alloy continues to run, but less abundantly than at the first period; at the end of a certain time, it appears a larger quantity, upon which the doors are opened; and the fourth period, similar to the second, but lasting six to eight hours, commences, and is also continued like the second. Lastly, when no more oxide is formed, the pieces are removed, and thrown, whilst hot, into water, so as to detach the oxidised crusts, with which they are covered. The pieces generally lose about a third of their weight during the whole operation. M. Karsten found, in five pieces, averaged in one operation:—

	1.	2.	3.	4.	5.
Copper.....	83.7	83.6	82.4	87.3	90.9
Lead.....	16.3	16.4	17.6	12.7	9.1

He also submitted to analysis eight samples of the oxidised alloy, collected during the course of the three last periods of the sweating, and found them constituted as follows:—

	1st PERIOD.	2nd.	3rd.	4th PERIOD.	1st.	2nd.	3rd.
Oxide of lead.....	84.2	78.5	75.5	85.1	81.2	78.9	77.1
Protoxide of copper.....	4.1	7.9	9.3	4.1	4.3	6.3	7.6
Oxide of iron.....	6.4	6.3	9.3	6.4	6.3	9.3	6.3
Alumina.....	1.1	1.7	1.8	1.2	1.0	1.2	1.8
Silica.....	10.2	11.4	13.3	13.3	9.5	13.0	12.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

From these analyses it is seen that oxide of lead is the predominant material in these oxidised alloys, and that the proportion of the oxide keeps on diminishing from the commencement to the end of the second and fourth periods, whilst it augments from the commencement to the end of the third period. The silica and alumina, doubtless, proceed from the clay, of which the interior of the furnace is constructed. The silver is carried off by the lead in the oxidised alloy, and the amount that the oxidised pieces retain, is proportional to the quantity of lead in their constitution. The following is M. Karsten's view of that which takes place during the sweating. The residues of the liquation always contain more lead than the alloy in definite proportions, which forms at the temperature of liquation—one portion of the excess of metal runs off as soon as the blocks have arrived at a certain temperature (first period). When the furnace doors are opened, the molecules of lead, which are found at the surface of the pieces, oxidise and fuse, carrying with them the silver they contain, and a certain quantity of oxide of copper, which forms at the same time. The molecules of lead thus oxidised are replaced by others, which are carried from the interior of the mass to the surface (second period). As the oxidation proceeds more rapidly than the transport of lead molecules from the interior, a time arrives when the quantity of air must be diminished (third period), in order to avoid the oxidation of too large a quantity of copper, and to allow the masses to regain a certain degree of solidity. When the molecules of lead, concentrated at first in the centre of these masses, have been spread uniformly throughout the mass, the doors are again opened, and a fourth period, similar to the second, commences. It is probable that, by a fifth and sixth period, analogous to the third and fourth, nearly the whole of the lead would be separated, and consequently nearly the whole of the silver in the alloy period arrives, when economical considerations prevent the repetition of the process. The presence of oxide of copper in the oxide of lead may be conceived to result from the action of the latter on metallic copper; but experiments made by Karsten, to ascertain the reciprocal action of copper on oxide of lead, as well as that of lead on oxide of copper, seem to prove that it is not so. The experiments alluded to are as follows:—He heated the mixed matters in well-closed Hessian crucibles, in a cupel furnace. The first series of crucibles contained one atom of metallic lead, and one atom of deutoxide (oxide) of copper; one atom of lead, and two atoms of copper; two atoms of lead, and one atom of oxide of copper; and four atoms of lead, and one atom of oxide of copper. The deutoxide of copper was reduced for the greater part to protoxide (suboxide) of copper, but the lead contained had very nearly six times as much oxygen as the copper.

In the second series, he employed one atom of oxide of lead and one atom of metallic copper, two atoms of oxide of lead and one atom of oxide of copper, and one atom of oxide of lead and one atom of oxide of copper, and the same as in the first series; that is to say, that in the oxidised matter, the lead contained always six times as much oxygen as the copper, and consequently, contained three atoms of oxide of lead, and one atom of suboxide of copper; but the oxidised alloy, which is formed during the sweating, is much less charged with copper: it does not, therefore, result from the action of oxide of lead on the copper.

The products of the sweating, then, are plumbiferous slags, which are treated for lead; the furnace bottoms impregnated with oxide of lead, and, lastly, the residual copper, which is refined for fine copper. This operation is founded on the action that air at a high temperature has upon those metals—as iron, &c.—which are in combination with the copper to be refined. The refining is carried on by fusing the alloy, and allowing a blast of air to act on the fused matter, slags from which are separated from time to time. The slags, taken at different times, from the commencement to the end of the operation, have the following constitution:—

	1st.	2nd.	3rd.	4th.	5th.
Oxide of lead.....	67.4	69.2	54.8	51.7	51.7
Protoxide of copper.....	6.2	10.4	19.3	19.8	19.8
Ditto of iron.....	1.0	1.1	1.1	1.2	1.2
Alumina.....	3.1	3.4	3.4	3.1	3.4
Silica.....	22.3	24.9	21.4	23.9	23.9
	100.0	100.0	100.0	100.0	100.0

These are very close approximations to bi-silicates. We see, moreover, that the most striking point in these analyses is, the progressive diminution of the oxide of lead, and the like increase of the oxide of copper. The copper thus refined, contains about half per cent. of lead. As observed, at the commencement of this day's article, the argentiferous copper might be treated by amalgamation. This method requires complicated and numerous operations, which it will suffice to analyse. The argentiferous copper is roasted many times at first in the air, then in reverberatory-furnaces; salt and chalk are then added, and it is roasted afresh. The amalgamation is then proceeded with, as we have already described, in the treatment of gold in this series. The amalgamation residues are fused for black copper, which is refined as usual. [In our next week's Journal, we shall commence the treatment of gold ores.]

### PATENT LAW REFORM.

As we have received several communications relative to the petition to Parliament, now being got up by Mr. Campin, praying for reform in our system of Patent Law, we are induced to publish a copy of it—more especially as the originator courts suggestions from patentees and others as to any points of importance which he may have left untouched:—

To the Honourable the Commons of the United Kingdom of Great Britain and Ireland in Parliament assembled.

The humble petition of Frederick William Campin, of 210, Strand, in the county of Middlesex, patent agent, and the undersigned engineers, builders, manufacturers, tradesmen, and others, being inventors, or parties otherwise interested in the Patent and Designs Laws of this realm.

Sheweth, That your petitioners would humbly represent to your honourable House, that the law and practice, in regard to granting patents for inventions, and the law and practice, in regard to registering designs, now in force, are such as to entail great hardship upon inventors and authors of designs, with regard to the securing the property in their new inventions. That these hardships are so manifest and apparent, that the system now existing is universally objected to, by all those who are at all aware of its character, as one tending to place a drag upon the commercial progress of the nation, by operating against inventors of small pecuniary means, principally on account of the heavy dues to be paid for letters patent, in such a way as to prevent, in very many cases, their bringing to the aid of our manufactures and commerce the valuable improvements which have resulted from their practical experience; and it especially acts as a preventive to the introduction amongst us of vast numbers of foreign inventions—thus leaving our countrymen in possession of all the resulting benefits.

That your petitioners consider the principal evils, *inter alia*, of the present system, and those to which they pray the serious attention of your honourable House to be—

1. The heavy amount of fees required to be paid before an inventor can have actual protection for his invention, amounting, with the necessary specifications, to between 300l. and 400l.

2. The practice of dating the patent the day of sealing, which is always some weeks after the application for it, rather than the day of actual application, which often causes much confusion, and leaves a tedious open period, which must, under the present practice, of necessity occur between such application and grant, to be defrauded of his just rights.

3. The practice of allowing patents to pass with vague and uncertain titles, or without any document defining their character, which places applicants, who come forward between the patent and the specification, in a position of much difficulty.

4. The expense attending the prosecution of patent rights before the courts of law, principally in consequence of the letters patent not being *prima facie* evidence of patent rights, and from the decision of such cases requiring the tribunal having jurisdiction to be specially qualified for that purpose, by being practically conversant with manufactures and the arts. The peculiar operation of the Designs Acts, 5 and 6 Vic., cap. 100, and 6 and 7 Vic., cap. 65, by which an inventor who is applying for letters patent, and for that purpose has paid large sums as Government dues, may be suddenly nonsuited by some other person registering a similar thing under these Acts.

5. The difficulty, in some cases almost insuperable, of getting information as to what patents have been granted, and in consequence of the distribution of the patent records over three distinct offices, and there being no authenticated and classified register of patents kept.

Your petitioners, therefore, humbly pray that your honourable House will take these facts into your gracious consideration, and provide—

1. That the protection of letters patent be, in future, accorded to inventors for a small sum of money, either in a similar manner to that adopted in France for some years past, where the patent dues are received by the State, or in some other mode amounting to the adoption of a system, and leaving a tedious open period, which must, under the present practice, of necessity occur between such application and grant, to be defrauded of his just rights.

2. That the titles or intitlements of patents be required to be precise and definite, and that a provisional or outline specification be necessary, in every case, at the time of fulfilling the application, as is now the practice in the case of opposed patents.

3. That patents be made *prima facie* evidence of the validity of patent rights, and that some commission or public board, composed of legal men, and men well acquainted with the practice of the useful arts, be appointed, to whom shall be referred all patent cases, to inquire and report upon any cases of novelty and practicality of the inventions, if three points be established, and this wholly at the cost of the party assuming.

4. That caveats be allowed against designs being registered without notice to caveaters, as is now the practice in regard to patents.

5. That the patent records be collected in one office, and that a classified and authentic list of patents be kept for reference. And your petitioners will ever pray, &c.

ARTIFICIAL PRODUCTION OF PRECIOUS STONES.—The process adopted by the author is, in reality, a crystallisation of the compound from a fused solution of its constituents in boric acid, the acid being evaporated by heat.

Alumina and magnesia, in proportion to form spinel, were mixed with fused boric acid, and 1 per cent. dichromate of potash. Exposed on platinum foil to the highest temperature of the porcelain furnaces of Sevres, a product was obtained, the surface and interior cavities of which were covered with crystalline facets, having the form of the regular octahedron, rose-red, transparent, and readily-scratching quartz. They were completely infusible by the blow-pipe, and there can be no doubt of their identity with spinel. A substitution of protoxide of manganese produced large laminae, having the form of equilateral triangles, or regular hexagons. These were apparently manganesian spinel, which has never yet been found in the mineral kingdom. Oxide of cobalt, substituted for magnesia, gave blue-black, regular, octahedra. Alumina and glucina, in proportions to form chrysoberyl, gave a mass, with a crystalline surface of great splendour, and scratching quartz, and even topaz.

The hardness was, therefore, that of natural chrysoberyl. Silicates, infusible in furnaces, can be formed by the same process. The constituents of emerald gave a substance which readily scratched quartz, and had the form of the regular hexagon.—M. ERMANN: *Comptes Rendus*.

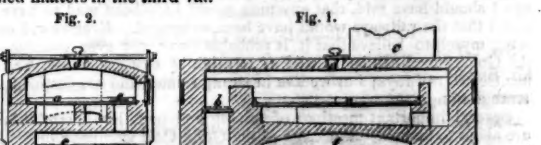
### METALLIC ALLOYS—IMPROVEMENTS IN DYEING.

[Specification of patent granted to Mr. Robert Oxland, of Plymouth, chemist, for improvements in dyeing: certain parts of which improvements are applicable to the manufacture of metallic alloys.]—*Newton's London Journal*.

The improvements in dyeing, which form the principal portion of this invention, consist in preparing and applying tungstate of soda as a substitute for the various preparations of tin usually employed as mordants in dyeing. The tungstate of soda may be used alone, or in combination with various acids; in the latter case, it should be first dissolved in a larger quantity of water than is merely necessary for its solution (say, 1 oz. of the tungstate in a quart of water); and then the acid may be added until all the alkali is saturated, and a small quantity of acid remains in excess. Wool, either in the skein or piece, may be dyed by first boiling it in a solution, made in the manner above described, with nitro-muriatic acid, and subsequently in the dye-bath; or the solution may be mixed with the dye, and the cloth boiled therein, without any other previous preparation than the usual cleansing process: by such treatment, with logwood as the dye, a violet colour will be produced, passing into a claret, and finally, if the boiling be continued, changing to a black.

In manufacturing the tungstate of soda, the patentee employs wolfram (the native tungstate of iron and manganese); or, when native tungstic acid can be obtained, it may be substituted for the wolfram, and treated in the same manner. The wolfram is either found alone or associated with tin ores. When the tin ores are employed, the ore is to be first dressed in the usual manner, until ready for smelting; then, after the ore has been dried, common alkali, or soda-ash, is to be mixed with it, in the proportion of the chemical equivalent of the tungstic acid contained in the wolfram mixed with the ore; that is to say, suppose the ore to contain 20 per cent. of wolfram, then every hundred parts of such ore will contain 15 parts of tungstic acid, the chemical equivalent of soda for which will be 3½ parts; and, if a soda-ash, containing 50 per cent. of alkali, be employed, the quantity of soda-ash required will be 7 parts. When the ore and soda-ash have been mixed, the furnace, hereafter described, is charged therewith. Sulphate of soda may be substituted for the soda-ash; in which case it is to be used in the proportion of 8 parts of finely-pulverised sulphate of soda (instead of 7 parts of soda-ash of 50 per cent.) mixed with one-fourth of its weight of coal, in fine powder; and the charge, when in the furnace, must be exposed to the action of heat longer than when soda-ash is employed, or until all appearance of combustion ceases.

The charge drawn from the furnace will consist of the native oxide of tin, the soluble tungstate of soda, with the oxides of iron and manganese, and a small proportion of silica. These substances are separated by the following process of lixiviation:—Three vats of wood or iron, say 5 ft. long, 3 ft. wide, and 3 ft. deep, are placed side by side; below each is a vessel, of about one-third of their capacity, to receive the liquor that runs from a plug-hole in the side of the vats; and there is a filter in each vat, in front of the plug-hole, consisting of a little straw, or tow, over which a piece of perforated metal is placed, and is kept down by a few clean stones. The first vat is partially filled with water, and the charges from the furnace, when cooled down to a black heat, are thrown into it until it is nearly full; the vat is then filled with water, and allowed to stand for about half an hour; after which, the plug is partially drawn, and the clear solution of tungstate of soda is allowed to descend into the receiver; from the receiver it is removed to the evaporating-pans, and concentrated to the crystallising point (indicated by the formation of a permanent saline crust over the surface of the liquor); and it is then put into coolers, to crystallise. As the liquor runs out, the vat is to be kept full by the addition of water; and when the liquor in the receiver is reduced in strength to 25° Twaddle, it should be no longer removed to the evaporating-pans, but pumped into the second vat, to commence the lixiviation of the next lot of calcined products, instead of using water alone; and the second vat is to be kept continually filled with liquor that runs from the first, until that liquor no longer contains any saline matter, or, at most, is not stronger than 2° or 3°; when the liquor in the receiver of the second vat is not stronger than 25°, it is used, in the manner just described, for the lixiviation of fresh calcined matters in the third vat.



The furnace employed in effecting the above-mentioned calcination is shown in the annexed cuts; fig. 1, is a longitudinal section; fig. 2, a transverse section; and fig. 3, a horizontal section of the same.

a is a plate of iron, which is cast in two pieces, and forms the sole of the furnace; it is 9 ft. long, 6 ft. broad at the widest part, and 1 in. thick; the flame and heated gases from the fire-place, b, pass over it, and then circulate beneath it, before entering the chimney, c, as will be understood on examining the different views of the furnace. The charge is introduced into the furnace through the hole, d; and it is drawn through an opening in the sole-plate (which is kept closed, during the calcination, by an iron-plate, e), into the arched receptacle, f, below. According as the ore is coarsely or finely ground, the charges will vary from 6 to 10 cwt. of ore, with its complement of alkali; and if the furnace be kept at a red heat, and the charge is well managed, eight charges may be drawn in 24 hours.

The improvements in the manufacture of metallic alloys, referred to in the title of this patent, are stated to consist in preparing metallic tungsten for the manufacture of its various alloys with other metals. Under this head, two methods of obtaining tungsten from tungstate of soda are described. The first method consists in digesting tungstate of soda in cold muriatic acid, removing the solution obtained, and adding successive portions of the acid until the whole of the tungstate of soda is decomposed; the tungstic acid remaining is washed with cold water, to remove any adhering saline matters, and then dried on brick or earthenware; after which, it is reduced in the metallic form, by mixing it with a coarse oil or tar, or with charcoal or coal in fine powder, putting the mixture in a crucible lined with charcoal, and exposing it to a strong red-heat for about an hour.

The second method consists in mixing the tungstate of soda with charcoal, or coal, in fine powder, and exposing the mixture, for about an hour, to a strong red heat, in a crucible lined with charcoal; by this means the tungstic acid will be reduced to the metallic form; and the soda, originally combined with it, will be converted into carbonate of soda, which may be separated by lixiviation, leaving the metallic tungsten clean and ready for use.

### IMPROVED MACHINE FOR ROLLING IRON.—Mr. Benjamin Norton, of Boonton, New Jersey, U.S., has recently obtained a patent for an improvement in the machine for rolling iron.

In describing his invention, the patentee says:—"In rolling the billets of iron that are to be converted into hoop-iron, or into scroll, band, or other iron of a like character, the apparatus used, as ordinarily constructed, consists of three rollers, the axes of which are in the same vertical plane. The billet is passed through a groove in the lowermost pair, and is returned through a groove in the uppermost pair, by which it is prepared to be passed through the smooth or finishing rollers. In my improved apparatus I use but two rollers, in which the billet is first passed in the usual way; as it passes from between these rollers on the rear side, it enters a curved trough, which I call a receiver, and this trough conducts it round the rear side of the upper roller towards the workman in front, who passes it into the groove in the first instance, and who then passes it into a second groove, formed in the same rollers;" by which arrangement much time and friction are saved, and other obvious advantages obtained. The patentee claims the combination of the covered trough, or receiver, with a pair of rollers, for the purpose of conveying the strand to the front of the rollers, in combination with the employment of the second groove, or grooves, in the lower roller, and thereby admitting of the widening out of the collar.

SLAUGHTER'S LOCOMOTIVES.—In the *Mining Journal* of Feb. 5, we gave the particulars of some improvements in the locomotive engine, recently patented by Mr. Slaughter, of the Avonvale Iron-Works, Bristol. "An Engineer," writing to the *Railway Record*, last week, says:—"The method adopted of attaching the driving-wheels on the crank arm is decidedly an improvement of inside cylinder engines, as it enables the boiler to be placed nearer the crank axle. I am not aware, however, that Mr. Slaughter can claim this as his improvement—the plan having been adopted in the United States above two years since."



## Original Correspondence.

## ELBE COPPER WORKS.

Sir,—During a recent tour in Germany, business obliged me to visit the city of Hamburg. On my arrival there, I heard that works for the smelting of copper ore on the English principle were established in the vicinity of that city. Although I have been for years connected with the copper trade, I was totally unconscious of the existence of this establishment; and, as I am perfectly aware it is comparatively unknown in England, I presume, at this period, when changes are contemplated in the duties on foreign copper ores, a brief description of the Elbe Works will not be uninteresting to your numerous readers interested in this trade.

These works are situated by the banks of the Elbe, on a small island, called Steenverder, under the dominion of the republic of Hamburg; they are about 120 ft. long by 40 broad, and contain three ore furnaces, which smelt about 150 tons of ore per week, a metal furnace, and a roaster, of the usual dimensions, together with a refinery, capable of turning out 4 tons of cake copper every charge. The smelting-house, coal-sheds, ore and copper warehouses, are on a site of about three acres of land, which is inclosed by a high wooden fence—strangers being rigorously excluded.

The vessels lay off the works, and the ore and coals are conveyed about 100 yards, up a small creek, in lighters, from whence they are drawn by a train-wagon up an inclined plane, and deposited in their several warehouses—this is worked by a small steam-engine of about 8-horse power. The coals, which are Newcastle and Sunderland mixed, are delivered in the works at the cost of about 18s. per ton. The sand, which is used for the bottoms of the furnaces, is taken from the Elbe; it is equally as good as that used at Swansea, and is obtained at a very trifling expense. The fire-bricks are purchased from Newcastle, and cost about 8l. 7s. to 3l. 10s. per 1000, and have been found to be a good and serviceable article; very little clay is used in repairing the sides of the furnaces, the proprietors having discovered the Elbe sand to answer the purpose equally as well, and at a considerably lower cost. The furnaces have been erected by German bricklayers; and though rather massive in their appearance, and without the finish generally observed in those built by English artificers, they work well. All the castings were likewise manufactured in Germany. The ores have hitherto been obtained from South America, and consist of yellow pyrites and the blue and green oxides of copper, and vary from 15 to 30 per cent.; they are not subjected to the process of calcination, as on their being run down from the raw state, they produce a regulus nearly equal to white metal—this, on being roasted for three hours, and run down, makes a good purple metal, which afterwards is excessively tractable in the roaster. The slags from the ores are remarkably clean, and, on an average, do not contain  $\frac{1}{10}$  per cent. of copper. During the subsequent processes, very few slags accrue, which prevent that accumulation and remelting, so much to be avoided. A calciner is now in course of erection, as it is the intention of the proprietors to become purchasers of ores; and I believe they are in treaty with some of the proprietors of the small Norwegian mines, who hitherto have not been able to avail themselves of their mineral treasures, on account of their inability to smelt on the spot, and the cost of freight and charges in England. These works were commenced last October, and they have met with such success, that the proprietors have at this time, on the stocks, three barque ships, building expressly for this trade. The copper produced is of a good and tough quality, and finds a ready sale; the ingots are immediately disposed of to the small manufacturers in Hamburg. At Lubeck, there are likewise rolling-mills, so that they have no difficulty in disposing of their tough cake, those having hitherto been supplied from England. And though I do not think they wish to compete with the English in a foreign market, they will endeavour, as far as possible, to engross the German to themselves, more especially as they will not interfere with the interior, which has hitherto been supplied from the Hanoverian, Prussian, and Saxon works, who smelt by charcoal, but with those parts which have been supplied from England over Hamburg.—DELTA: Fleet-street, April 6.

## LEATHER—THE CUPEL—COPPER, &amp;c.

Sir,—I am no tanner, and have neither "part nor lot" in the matter. Mr. Snyder may remain at perfect ease as to his patent; and its merit I never doubted, and, therefore, did not question. Incidentally, and without any reference to the distinct and peculiar principles eliminated in his patent for tanning, I made the cursory remark. As to the "blooming," an eminent tanner, in Huntingdonshire, requested my opinion on the question—(an occurrence of 25 years by-gone.) I was then a stranger to the phenomenon, and undertook a series of experiments, which cost me, I remember, 10l. 10s. nearly; and, though I accomplished the purpose, the generous tanner never offered me a farthing of remuneration, and I scorned to present an account of my expenses.

I notice the process of assay treated of in your columns. Allow me to state, that the assayer is not aware—at least generally—that the cupel will be found to have absorbed a portion of the precious metal; for, when I have crushed the cupel, I have found small portions of silver among the fragments. In the refinement of gold and silver by assay, this fact should not be overlooked in the estimate.

Nothing, as I have elsewhere said (*Communications*, p. 17), can be more dangerous than the use of copper wire-gauze in Davy's safety-lamp; and, therefore, copper should form no part of the lamp cylinder, because copper is acted upon by hydro-carbonate; and the green flame of inflamed "fire-damp," in contact with copper wire-gauze, affords sufficient proof of the action. I have ascribed many of the dangers resulting from explosions by the Davy to the indiscriminate use of copper and iron wire-gauze lamps. I denounced them at Wigan, where copper and iron wire-gauze Davy lamps were used indiscriminately, and where preference was given to the former, because not so susceptible as the latter of the corroding influences of the atmosphere of the mine. J. MURRAY.

Portland-place, Hull, April 4.  
Errata.—"Crosse's Mite" is "leg" "has formed" not "found;" and "this acarus" not "the acarus."

## A PROBLEM.

Suppose (P) pounds raised 1 ft. per minute, represented the power required to roll a certain cylinder over a certain uniform inflexible rod at a given rate. Also suppose (P+2) pounds raised 1 ft. per minute, represented the power required to roll the said cylinder at the given rate over a certain uniform substance placed equally throughout upon the said rod, the said substance being crushed thereon. Question.—Would the value of  $\frac{2}{P}$  be less the greater the diameter of the cylinder, or the greater the value of P, supposing that the rod, substance, and rate of motion remained the same?—Question 2. Suppose two cylinders, of equal length and weight, one composed of lead, and the other composed of some material of less specific gravity; then would less power be required to perform the said work with the latter cylinder (because of being the greatest in diameter) than with the former one? Mathematical proof required.—Note 1. It is a well-established fact, that the greater the diameter of the wheel on a carriage (the axle remaining the same), the less the power required to drag that carriage over any obstacles that the wheels may come in contact with; and the purpose of this problem is to determine whether the same is not true (within certain limits) with respect to the power required to drag a carriage over any substance that would be crushed by the wheels thereof passing over that substance.—Note 2. If the problem should be objected to, in consequence of having to consider the friction that the said substance would occasion to the surface of the cylinder, while or after being crushed; such objection may be avoided by supposing that the cylinder rolled over moveable inclined planes, of equal inclination and dimensions, and composed of the same material as the rod itself (which, suppose for example was iron), and so contrived that their upper surfaces would become parallel to the horizon when a certain pressure was produced thereon, each so by the same pressure (the inclined planes being supposed to be connected with such machinery as would cause them to resist any pressure less than a certain pressure on their upper surfaces, without their original position being thereby altered, and also such, that when and after their position became altered, however little, by the cylinder moving upon them, they would have no tendency to resume their former position), and cause jointly as smooth a surface, while the cylinder was passing over them, as the rod itself. Then moving those inclined planes to their limit, may be supposed to represent the crushing of the said substance.—Note 3. If the given cylinder exceeded a certain weight (that is, a certain weight, whose value depended upon the power required to crush the substance), it would roll horizontally over the substance; because the centre of the cylinder would not in that case become vertical over any portion of the substance, until after such portion of it had become completely crushed.—J. WATZERS, Jun., *Guilford Hotel, City, April 6.*

P.S.—The resistance to the motion of a carriage arising from dust, or other comparatively small matter on the rails, which crushes under the wheels, increases nearly as the square root of the cube of the weight upon its axles. The power required to overcome such resistance, is inversely as the radius of the wheel.—[See *Tredgold's Work on Railroads*, page 44.]—N.B. These conclusions, however, are determined by partly neglecting to consider the height of the substance crushed, the same being supposed to be insignificant when compared with the radius of the wheel.—J. W.

THE SAFETY FUSE IN AMERICA.—A specimen of Bickford and Davy's safety-fuse was lately exhibited at a meeting of the Franklin Institute, Pennsylvania. The fuse, which was manufactured by Messrs. Bacon and Bickford, of Simsbury, Connecticut, was placed in a tub of water, each of the ends projecting a few inches from the surface; one of the ends being ignited, the fuse burned throughout its whole length—that portion of the outer covering remaining under water being unconsumed; while that of the two projecting ends were completely burned. From the successful result of the experiment, it was roved that the article was well adapted to the purposes intended.

## Proceedings of Public Companies.

## MEETINGS DURING THE ENSUING WEEK.

THURSDAY.....Asturian Mining Company—offices, at Two.  
WEDNESDAY.....Combmarlin and North Devon Mining Company—at the mine, at Two; and, on the following day, at Twelve.  
Licensed Victuallers and General Fire and Life Assurance Company—offices, at One.  
THURSDAY.....Marke Valley Mining Company—White Hart Hotel, Salisbury, Twelve.  
Imperial Gas-Light and Coke Company—offices, at One.  
Derbyshire, Staffordshire, and Worcestershire Railway—offices, Twelve.  
FRIDAY.....Stray Park and Camborne Veau Mines Company—at the mine, at Two.  
St. John del Rey Mining Company—offices, at Two.  
Southwark and Vauxhall Water Company—offices, at One.

[The meetings of Mining Companies are inserted among the Mining Intelligence.]

## ROYAL MAIL STEAM-PACKET COMPANY.

The annual general meeting of this company was held at the London Tavern, on Thursday last. ANDREW COLVILLE, Esq., in the chair.

Captain CHAPPELLE, R.N., read the following report:—

The accounts of the company, for the last year, have already been transmitted to each of the shareholders. It will be observed that there has been an increase, both upon the receipts and the expenditure. As relates to the working account, contrasted with that of the preceding year, the directors submit the following remarks. The first item comprehends charges for the hire of the *Arab* steam-vessel at Havanna; remuneration for services rendered on occasion of the wreck of the *Zeus*, by the Spanish brig *Emilio*; for hire of the Spanish schooner *Zepo*, and for charter of sundry small vessels at Bermuda and St. Thomas, to convey the mails to their respective destinations. The charges for cost, freight, and other expenses for coal, as well as those for wages, port charges, and pilotage, coal sacks, and office and law expenses, although with an augmented business, are, in the aggregate, 624l. 5s. 6d. less in 1847 than in the preceding year. The increase upon provisions, stores, general service and stations, salaries and repairs, having been explained in the report made to the proprietors in October last, it is unnecessary to refer further to those items upon the present occasion. On the credit side of this account, there is a decrease in the homeward freight, arising (as explained in October last) from diminished shipment of specie in Mexico, and there is less receipt from inter-colonial and homeward passage-money, which is also chiefly to be attributed to the hostilities in that country. The total receipts, however, from freight and passage money in 1847, exceed those of the previous year by 3845l. 9s. 6d. By the profit and loss account it will be seen that, from the profits of 1846, a sum of 56,594l. 15s. 11d. has been carried to the reserve fund, making a total to the credit of that account in the balance-sheet of 70,659l. 16s. 6d. The balance upon the profit and loss account for 1847, after charging the dividend declared in October last, amounts to 74,018l. 13s. 6d., subject to the payment of the forthcoming dividend. It will be observed, that new boilers for *Severn*, new side, levers, and iron beams for the *Arco*, as well as extra repairing and materially strengthening the *Teviot*, amounting in the whole to 13,555l. 8s. 7d., are charged in the profit and loss account, as not being properly chargeable to the working account of the year 1847. By the balance-sheet it will be observed, that the sum standing to the credit of the insurance account, after deducting the cost of the *Grand Western*, purchased to supply the place of the *Teviot*, has not been diminished, amounting on the 31st December, 1847, to 74,381l. 5s., to which was added in January last the sum of 35,000l., making a total of 99,381l. 5s., invested in the purchase of 100,000l. 7s. 7d.,  $\frac{3}{4}$  per Cent. Stock; the general investment of 55,000l. remaining as at the end of the year 1846.

Referring to an observation which was made in the report presented to the general meeting in October last, stating the mode in which the working account, for the first half of each year, has heretofore been presented, the directors deem it proper to state their intention to assimilate that account, in future, to the method in which the annual accounts are prepared, as the effect of the company's operations will by that means be more distinctly exhibited. Since the last general meeting was held, an arrangement has been made, giving to the West India colonies a direct monthly postal communication with the Northern States of America, by which the company's operations are extended to New York; and this new line, *via* Bermuda, will be commenced on the 7th of next month. The company, however, are at liberty to discontinue this branch of service, should it be found hereafter that contrary to expectation, it cannot be maintained with advantage. The directors, having taken into consideration all the circumstances of the company, recommend that a dividend of 2l. per share, exclusive of income tax, be declared; the same to be payable on and after the 10th inst.

The CHAIRMAN moved the adoption of the report, in doing which he said that everything was going on satisfactorily.—The report was adopted.

Mr. KIDWAY contended, that an additional dividend of 5s. per share ought to be made on this occasion; as the company's finances would warrant it. The CHAIRMAN said, the directors had gone to the greatest extent possible in fixing the dividend, so as to be just to the proprietors. They must recollect, that the contract might have an end; and, therefore, they were anxious that the vessels and the finances of the company should bear as good a condition at that time, as before it was entered into.

The dividend was agreed to; and a vote of thanks having been passed to the chairman and directors, the meeting separated.

## INDIA AND LONDON LIFE ASSURANCE COMPANY.

A general meeting of this company was held at the offices, Waterloo-place, on Monday last.—The CHAIRMAN, in the chair.—The CHAIRMAN, in opening the business, explained, that that meeting was held by adjournment from the previous year, in consequence of a sufficient number of proprietors not having been present to constitute a meeting, in accordance with the Deed of Settlement.—Mr. IRVINE (the manager) read the auditors' report of the affairs of the company from its commencement, on the 25th of April, 1846, to the 28th of Feb., 1847, which was approved.—The general meeting for the last year was then held, and the auditor's report for the last March to the 31st Dec., 1847, was read and approved. It appeared from these statements, that 188 policies had been effected, assuring 121,077l., producing premiums to the amount of 77802l. 2s. 10d.—The CHAIRMAN stated that, in addition to the European business, agencies had been appointed in India, at Calcutta, Bombay, Madras, and Ceylon; and that the progress of the company generally had been most satisfactory—particularly so, when they remembered the state of commercial distress which had existed, both in this country and in India. The hon. gentlemen then alluded to the union of this company with the Great Britain Mutual Life Assurance Society, by which arrangement the business of the two offices was conducted by the same board of directors, officers, and servants, and under one roof—thus effecting a considerable saving in the annual expenditure of both; whilst the accounts and funds of the two offices were kept quite separate and distinct from each other.—Several shareholders having expressed their approbation of the manner in which the business of the company is conducted, thanks were voted to the chairman, directors, and auditors, and the meeting separated.

SOUTH DEVON RAILWAY.—An extraordinary general meeting was held at the Royal Hotel, Plymouth, on Tuesday, the 4th inst.—Mr. GILL in the chair.—The meeting was convened for the purpose of obtaining the approval of the proprietors to two bills now before Parliament. The first related to the Plymouth Great Western Docks, situated at the terminus of the South Devon Railway. This bill sought to obtain powers of assistance from the Great Western Railway, 75000l.; Bristol and Exeter, 75000l.; and South Devon, 15,000l. The last amount was granted at a meeting of the South Devon proprietors held in January, 1847, and confirmed in the following May; but Legislative power had not been obtained, in consequence of a Parliamentary failure last session. Through the altered condition of the money market, and from some local differences, the meeting raised at first considerable objection to the fulfilment of their resolution last year; but when it was declared that, upon the faith of that resolution, 15 directors had become personally responsible in 1000l. each, the proprietors consented to relieve the board from this responsibility. Permissive power was also obtained in this bill to increase the subscription by 10,000l., if the shareholders of the South Devon should hereafter consent. This clause was agreed to on the distinct understanding that, by obtaining the power, the shareholders could, in no measure, be committed to the principle of any further grant beyond the 15,000l. To the second bill, relative to the Cornwall Railway, which sought assistance to the amount of 66,666l., beyond a larger amount previously guaranteed by the South Devon Railway, there was evidently so much disinclination to give consent, that the chairman withdrew the proposition. It transpired that Mr. Peto, the contractor, had had some negotiation with the Cornwall directors, for the purpose of taking the works of the line, and of holding a large interest in the undertaking. This negotiation is understood to have gone off, and Mr. Peto has withdrawn from any connection with the Cornwall Railway. The exact period of opening the South Devon to Lavia, could not be stated by the chairman.

WEST CORNWALL RAILWAY.—The adjourned half-yearly general meeting of proprietors was held at the King's Arms Hotel, in Palace-yard, Westminster, on Wednesday last.—Capt. MOONSON in the chair.—The report of the committee stated, that it was estimated by Mr. Brunel that the line from Hayle to Penzance would cost 100,000l. for a double line, and 89,000l. for a single line; from Hayle to Redruth, 155,000l. for a double, and 100,000l. for a single line; from Redruth to Truro Junction, 125,000l. for a double, and 110,000l. for a single line; and for the Falmouth branch, 95,000l. for a double, and 80,000l. for a single line—making, in the whole, a total mileage of nearly 40 miles; and, as the traffic of these districts was very extensive, holding out a prospect of a good return, the report recommended that these lines should be proceeded with by degrees, after a lapse of six months. The amount raised by the West Cornwall Company, up to the present time, was 64,687l. 10s., of which 22,695l. 2s. had been paid to the solicitors on account, 10,668l. 13s. 7d. to the engineers, and 6000l. on account of the Hayle Railway, leaving a balance in hand of 1941l. 17s. 8d. The liabilities of the company amounted to 24,732l. 6s. 6d. The shares, however, which had already been allotted, would yield 271,938l.; and this sum, after satisfying the liabilities, would enable the company to complete the lines already mentioned, without having recourse to borrowing power. After some discussion, it was agreed that the meeting should be adjourned, to enable the directors to consider what course they thought it best to adopt under the circumstances, and the meeting terminated.

## THAMES TUNNEL COMPANY.

The number of passengers who passed through the Tunnel in the week ending April 1, was 46,909; amount of money, £195 9s. 1d.

## PROGRESS OF CONTINENTAL RAILWAYS.

It would appear, by some statistics recently published in France, that the progress of railway works throughout the continent, especially in the German states, has been more extensive than is perhaps supposed. After Germany follows France, then Holland, Belgium, Poland, and Italy. Russia stands low in the scale—even Hungary and Denmark, according to this statement, showing a greater length of railway accomplished than at present exists within the territory of the Czar.

Placing these statistics in the order given by the compiler, it seems that France, at the close of the year 1846, maintained in active operation 1017 miles of railway, which, with the addition of works completed and opened for public use in the course of the following year, constituted at the end of that period, a total length of railway, equal to about 1395 miles. At the end of the year 1846, Germany possessed about 3096 miles of railway, completed and in operation, and in the course of the following year 795 miles additional were opened; so that at the close of 1847, the total extent of railway in that country amounted to 3891 miles.

Belgium, in December, 1846, possessed 466 miles of railway, and in 1847 the completed quantity of new undertakings was 90 miles—making a length of railway in active operation at the end of the last-mentioned year, of 546 miles. The length of railway opened in Holland at the close of 1846 was 108 miles; in 1847 only 15 additional were completed, so that at the close of that year about 123 miles of railway were altogether in operation.

Denmark, at the end of 1847, possessed 188 miles of railway in active operation. Switzerland figures for a small extent of railway; in 1846 not more than three miles of line was completed; this was increased in 1847 by the opening of about 15 miles of the Zurich and Basle Railway, making the total about 18 miles. In Italy, at the end of 1847, the length of railway in operation was 183 miles; in 1846 about 159 miles had, up to that date, been opened. Hungary possessed, at the commencement of the present year, 155 miles of railway in active work; at the close of 1846 about half that extent had been completed.

It is stated that Russia, in 1846, had only 20 miles of railway carried out; in 1847 this amount was increased to 51 miles. In the kingdom of Poland 159 miles of railway were completed by the close of 1846; in 1847 a further extent of 54 miles was accomplished—making the total length 213 miles.

THE WORKS ON THE CHESTER AND HOLYHEAD RAILWAY.—This line is rapidly approaching completion. Last week a party of directors, accompanied by the principal officers of the company, proceeded from Chester to Holyhead, for the purpose of inspecting the line from end to end, in order to determine the period when it may be opened throughout. With the exception of the passage of the Conway and the Menai Straits, the whole distance was traversed by the railway. The trip from Chester to Conway, 45 miles, was performed, including one stoppage of 4 m. in 1 h. 17 m. All the preparations for raising the Conway Bridge are now completed, and operations were commenced on Tuesday, which, it is expected, will be completed by the end of the week, so as to allow of the trains continuing their journey to Bangor. Between Conway and Bangor everything is ready for opening. The Britannia Bridge, across the Menai Straits, is in active progress, both as respects the masonry and the tubes. The pier on the Britannia Rock, upon which the completion depends, is now about 55 ft. above high-water mark, leaving 50 ft. still to be added, to complete it to the tube level. More than half the iron-work of the tubes is finished. From the Menai Straits to Holyhead (22 miles), was traversed by the locomotive engine and train in 55 m. The line is in excellent order, and presents almost a singular instance of a contract of that extent being delivered over by the contractor to the company in a finished state on the very day fixed by the contract. At Holyhead, the improvements made in the old harbour, and the arrangements for proceeding with the new harbour, were inspected; the result of the inspection was so satisfactory, as to determine the directors to open the line throughout to Holyhead as soon as the Conway is passable, which it is expected will be by the 1st of May. Pending the completion of the Britannia Bridge, the traffic will be conveyed by the common road, and over the suspension bridge, a distance of about 8½ miles.

DUBLIN AND CASHEL RAILWAY.—A paragraph having been published, stating that part of this line (the Great Southern and Western) had subsided, where it passes over a deep bog, or morass, Sir John Macneill, engineer to the company, has written to the *Times*, stating that, "As this statement, so circumstantially given, is devoid of the least portion of truth, and, no doubt, manufactured for stock-jobbing purposes, I am sure you will not hesitate to contradict it. In the forming of the line some difficulty presented itself—as much from the great quantity of rain, which fell during the autumn and winter months, as from any other cause. There were no piles driven, nor any lives lost, as stated in the paragraph in question. The rails have been laid on a timber raft, or platform, which was completed in 8 or 10 days. The line was inspected and opened early last month, and the trains have run with the most perfect regularity every day since."

PARIS AND STRASBURG RAILWAY.—The works on this line, which were commenced two years ago, have not been interrupted during the recent events in France. The Minister of Public Works has given orders to proceed with all possible rapidity with the section between Paris and Epemay. The bridges and tunnels are almost finished, and the other operations are completed over a space of five kilometres. As by degrees the earthworks are finished, the company on its part is laying down the rails. All the contracts have been made. The rails, chairs, sleepers, &c., are from day to day brought on the line, and the rolling material—engines, carriages, waggons, &c.—will be ready in a few months. By the combined efforts of the Government and the company, this eastern line, which will run to the frontier of Germany, may be open to public traffic from Paris to Epemay, a distance of 440 kilometres. The financial resources at the disposal of the concessionary company, together with the caution money which becomes available as, by degrees, the works advance, will enable the company to continue without making a call on the proprietors. The works for the branch from Frouard to the Prussian frontier, which are exclusively at the charge of the company, are in the course of execution; and, at the urgent request of the Mayor of Metz and the Government commissioner, the company has just authorised the employment of another gang of labourers, previously out of work.

ENGLISH RAILWAY MECHANICS EXPELLED FROM FRANCE.—A meeting of engineers, engine-men, drivers, fitters, and others, employed on the English lines of railway at home, was held on Monday night, at the Green Man, Tooley-street, Borough, for the purpose of taking into consideration the situation of their fellow-countrymen recently engaged in similar occupations on lines of railway in France.—Mr. JAMES WARD was in the chair.—The meeting was numerously attended, and was in the nature of a strong expression of sympathy on the part of the English workmen for the sufferings of their fellow-countrymen who have been expelled from France by the recent revolutionary proceedings in that country—their furniture, implements, &c., destroyed—their contracts with the company suddenly broken—and they themselves compelled to fly, in many instances, under threats of personal violence. Details of these events have been already laid before the public by the sufferers themselves, at a meeting held at the same house on the 27th of last month. The actual loss sustained in furniture, tools, and broken contracts, as far as the same have yet been ascertained and proved up to this time, amounts to little short of 8000l. amongst this class alone.—Mr. MATHER addressed the meeting at some length, in a temperate and judicious appeal in favour of the claim which he conceived the expelled workmen had upon the support of their fellow-countrymen in obtaining compensation for the injuries which had been cruelly inflicted upon them; and several letters, confirmatory of the statement made, having been read, the meeting unanimously came to the following resolution, moved by Mr. SIMMONS (in the employ of the Great Western Railway Company), and seconded by Mr. WILLIAM SCOTT (in the employ of the South-Eastern Railway Company):—"That this meeting having heard the statement of their fellow working men who have been violently expelled from France, and robbed of their property, and deprived of their wages after having been seduced from this country to undertake work there, are peculiarly entitled to public sympathy in their present distressed and unfortunate situation."—The second resolution, moved by Mr. B. DAWSON (in the employ of the South-Eastern Railway Company), and seconded by Mr. J. DREW (in the employ of the London, Brighton, and South Coast Railway Company), was in like manner carried unanimously—"That this meeting, consisting of engineers, drivers, and fitters, now engaged on various lines of English railway, do most heartily concur in the propriety of a subscription being immediately entered into for the purpose of enabling the committee (already appointed) to prosecute the claims of the injured parties to compensation: in such mode as they shall be advised best to adopt; and this meeting pledges itself to support such subscription.—Mr. MATHER, on the part of the expelled English, cordially thanked his brethren for the handsome manner in which they had responded to the appeal made.—After a vote of thanks to the chairman, and to the press, to whom the aggrieved party look confidently for support, the business of the night terminated.

THE ELECTRIC TELEGRAPH.—The greatest number of letters, or signs, which have yet been conveyed by telegraph, in the United States, is stated to have been 25,000 in an hour and a half—being at the rate of 277 and a fraction per min.; while in England, Mr. Bain has actually accomplished 1000 per min.!

THE ELECTRIC TELEGRAPH.—THE LIGHTNING.—We understand that the lightning on Sunday had very considerable effect on the wires of the electric telegraph, particularly on the line eastward from Manchester to Norampton. Not only were the needles greatly deflected, and their power of answering to the handles considerably weakened, but those at the Norampton station were found to have had their poles reversed by some action of the electric fluid in the atmosphere. The mischief has since been repaired, and the needles are again in good working order. It is found, however, that those wires which pass through hilly districts, and are consequently conveyed through railway tunnels, are more deranged by electric or other causes, and the needles more deflected, than those of the more level tracts of country.—*Manchester Guardian*.



**NOTICE TO ADVERTISERS.**—The NUMBER of STAMPS issued by the authorities of the Stamp-office, during 1847, to the **DAILY NEWS**, was—**3,447,000.**

This, we believe, is within eight per cent. of the number issued to the *Morning Herald*, *Morning Chronicle*, and *Morning Post*, all put together. In addition to the above, issued to the "DAILY NEWS" morning paper, there were issued, for the evening edition, "THE EXPRESS" ..... 778,714.

Which was more, we believe, than were issued either to the *Globe* or *Standard*, evening papers.—The "DAILY NEWS," price THREEPENCE, is published every morning in time for the early mails.—Daily News Office, Whitefriars, Fleet-street.

## ANTIMONY AND SILVER-LEAD MINING AND SMELTING COMPANY.

1000 shares, of £5 each.  
**NOW AT WORK ON THE COST-BOOK PRINCIPLE.**  
 Applications for shares to be made to Mr. R. Tripp, Fore-street, Exeter; Messrs. W. King and Co., Newcastle-upon-Tyne; and Mr. Bartlett, 58, Lombard-street, London.

## CALEDONIAN RAILWAY COMPANY—LOANS ON DEBENTURES.

TENDERS FOR LOANS ON DEBENTURE BONDS are now RECEIVED in sums of not less than £500, for any number of years not exceeding five. Interest to be at the rate of 5 per cent. per annum, payable half-yearly, in London, Edinburgh, Glasgow, or in any country bank.

Tenders to be addressed to this office, giving full name and address of lender.—Particulars may also communicate with Messrs. Foster and Braithwaite, 68, Old Broad-street, London.

By order, D. RANKINE, Treasurer.

Caledonian Railway Office, Edinburgh, Feb. 28, 1848.

## STEAM TO INDIA AND CHINA, VIA EGYPT.—Regular MONTHLY MAIL (steam conveyance) for PASSENGERS and LIGHT GOODS to CEYLON, MADRAS, CALCUTTA, PENANG, SINGAPORE, and HONG-KONG.

THE PENINSULAR AND ORIENTAL STEAM NAVIGATION COMPANY

BOOK PASSENGERS and RECEIVE GOODS and PARCELS for the ABOVE PORTS by their steamers—starting from Southampton on the 30th; and from Suez on or about the 10th of every month.

For rates of passage-money, plans of the steamers, and to secure passages, apply at the company's office, No. 122, London-street, London.

## LAMBERT'S PATENT FLEXIBLE DIAPHRAGM

WATER VALVES, or TAPS.—A certain PREVENTATIVE OF LEAKAGE, superintending the use of the metal plug-tap, which is so continually out of order. They are more durable, less expensive, and being nearly frictionless, are opened and closed with perfect ease. They have been tested under various pressures, and have given the greatest satisfaction.—MANUFACTURED ONLY by the Patentees,

THOMAS LAMBERT & SON, Brass and Cook Founders,

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## PATENT FLEXIBLE INDIA-RUBBER PIPES AND TUBING.

For Railway Companies, Breweries, Distillers, Fire-Engines, Gas Companies, Gardening and Agricultural purposes, &c.

THE PATENT VULCANISED INDIA-RUBBER HOSE-PIPES

are made to stand hot liquor and acids, without injury—do not become hard or stiff in any temperature (but are always perfectly flexible); and as they require no application of oil or dressing, are particularly well adapted for Fire Engines, Pumps, Gas, Beer-Engines, Gardens, and all purposes where a perfectly Flexible Pipe is required.

Made all sizes, from 1-inch bore upwards, and of any length order.

Substantial India Rubber Goods, fitted with brass-taps, Copper branch and Rose's complete, ready to be attached to pumps, water-butts, or cisterns.

Sole manufacturer, JAMES LYNE HANCOCK,

Goswell Mews, Goswell-road, London.

N.B.—Vulcanised India-Rubber Washers, of all sizes, for joints of hot-water and steam-pipes, and Vulcanised Sheet Rubber, any thickness, for all kinds of joints, and other purposes.

## ADCOCK'S PATENT SPRAY PUMP.—This important

INVENTION having been PERFECTED, and brought into SUCCESSFUL

PRACTICAL OPERATION, the PATENTEE is ready to RECEIVE, and to execute,

ORDERS.—Apply to Henry Adcock, C.E., at his office, No. 2, Moorgate-street, London.

where pamphlets, descriptive of the invention, may be had; at the office of the *Mining Journal*, 28, Fleet-street; and through any respectable bookseller—price 6d.

## IMPORTANT TO RAILWAY AND STEAM NAVIGATION COMPANIES, MANUFACTURERS, AND ENGINEERS.

W. BROTHERTON AND CO.'S

PATENT LUBRICATING FLUID (or Animal Oil) FOR ALL DESCRIPTIONS

OF MACHINERY.

W. B. & CO. have the pleasure to state, that the above article is extensively used in

her Majesty's Steam Navy, and by several of the principal Steam Navigation and Railway Companies, and is pronounced by them, and by the first practical engineers of the day, to be far better adapted for the purposes of lubrication than any other article hitherto

used for such purposes. The Patent Lubricating Fluid is equally applicable for the most intricate and fine pieces of machinery, as for the heaviest bearings of the steam engine.

It is cheaper, much more economical, and cleaner than oils at present in use; is free from smell, and calculated to effect a vast saving in the expenditure of working steam powers.

Further particulars can be had, and testimonials sent, by application to the manufacturer,

W. BROTHERTON & CO., Hungerford Wharf, Strand, London.

N.B.—The above article will burn in lamps, and give a light equal to the best sperm oil.

## IMPROVEMENT IN RAILWAY SLEEPERS.—Mr. F. Busse, of Leipzig, secretary

of the Leipzig and Dresden Railway, has laid before the directors of English

railways his new invention to construct sleepers for railways from a certain

compound, cast around a wooden frame, which he calls *terresin*. Mr. Busse

claims to take out a patent for his invention, hoping it will soon come into

general use in England, in which case he is fully convinced that the boards of

directors and the engineers will by far prefer to deal with an invention which is

laid before them with an open spirit of confidence in the well-known honour of English

gentlemen, rather than to quarrel about licences. Mr. Busse, therefore, offers full scope

to all boards of directors and engineers in employing the said sleeper, trusting they will

grant him or his assignee, Messrs. Johnson, Cammell, and Co., Sheffield, 3d, for each

laid sleeper. It is a well-known fact, that wooden sleepers, either of pitch-pine or of

oak, are the most convenient and to lay rails upon. But, on the other hand, sleepers

of wood do not last long, in spite of all expensive doctoring with salts, sublimate and

anti-corrosive ingredients; after all, the vast consumption of wood is a drawback felt

severely, especially in England, where wood is scarce, and its importation from a good

country is considerable. It is, therefore, unquestionably a good plan, to substitute, instead

of wood, a material which is to be had in abundant quantities in England; and, by

manufacturing it into sleepers, only a small fraction of that wood is wanted which is now

used; and, furthermore, what is a prominent point of consideration, will be cheaper than

wood—so, at least, says Mr. Busse; and the following is his description of his invention:

—“My sleepers are manufactured by hand, just on the spot where they are wanted.

These sleepers have been tried on the Leipzig and Dresden and the Dresden and Sillesia

lines, and combine all the advantages which are reasonably to be expected from a good

sleeper. They are easy to make, are cheap and solid, and promise a duration for a period

of time not to be calculated; supposing only 30 years, it greatly exceeds that of wooden

sleepers. I have cast sleepers, according to my invention, 8 ft. long 14 in. broad at the

base, at an outlay amounting to less than 1 Prussian d. (2s.) the piece. The yet good

pieces out of the old worn sleepers may advantageously be cut for frame top-pieces.

The principle of my invention is to inclose a frame of entirely dry, well-seasoned, wood, air-

tight, in a substance which is not affected by the influence of water and air—it being the

result of experience, that, under such circumstances, the wood will not be destroyed at all,

or at least will last far longer. The method, after which I build and compose the said

sleepers, is as follows:—I take two pieces of wood, dried to the highest degree by artificial

heat in a stove. Immediately after drying, I dip these pieces in a boiling compound

of 10 lbs. of brimstone, and 100 lbs. of coal-tar, to which I add 80 lbs. of very fine powder

of caustic lime. This done, I scratch or take off with a knife the superfluous compound,

leaving only a thin coating on the wood. The pieces of wood thus prepared are now

brought anywhere along the line of the railway where coarse gravel is to be found—it

may be taken: out of the bed of a river, or from a quarry. The latter is to be preferred, containing

less earthy matter. The gravel washed with fine or coarse sand or small stones, the latter till

to an inch diameter, ought to be dried, or rather heated, before used. The wooden frame

is placed, the top-side to the bottom, in a conical iron or wooden mould, the latter material

is to be preferred, which is to be filled up with the compound which I call “*terresin*,”

and which is prepared as follows:—I take an iron vessel, large enough to hold a quantity

of *terresin*, sufficient to cast three sleepers; I melt 10 lbs. of brimstone, and 75 lbs.

of stiff coal-tar, and mix it by stirring with 100 lbs. of fine powder of well-dried fresh-

burned caustic lime, which is sieved in the air or with a little water. When powdered

chalk or plaster are cheaper, these materials may be used as well. The exact quantity

of lime, chalk, or plaster, for a given quantity of brimstone and coal-tar, is dependent

upon the quality of the said materials, and the choice of the right proportion must be

left to the best judgment of the manager. In case the tar should not be of good quality,

a little resin and grease may be added. To this compound add, always stirring and turning

## TO PROPRIETORS OF STEAM-ENGINES.—The saving

of FUEL being at this moment an object of vast importance, M. REMOND, of 37,

Great Charles-street, Birmingham, is ready to TREAT, on reasonable terms, with the

OWNERS OF STEAM-ENGINES, for the APPLICATION of his PATENTED IMPROVE-

MENTS, by which a great amount of fuel is economised—while, at the same time, more

power is secured. The nature and extent of these improvements (which may be adapted

to a comparatively small cost to any engine) were fully explained and spoken of in the

most favourable terms in the *Midland Counties Herald*, of the 20th of March; and they

may be ascertained by a reference to Messrs. Deale, of Bradford-street, Birmingham, by

whom they have been adopted with the most decided success.

BANKERS—London Joint-Stock Bank.

SOLICITORS—Messrs. Fryer, Carling, and Hope.

AUDITOR—Mr. J. E. Elsey.

SECRETARY—Mr. William Nicholson.

This company is formed for the purpose of working a portion, consisting of 52 acres, of

the Great Bangor Slate Bed, situated about five miles from the port of Bangor, on the

London and Holyhead road, and held under a lease, of which 21 years are unexpired.

The Coyntor estate adjoins the celebrated quarry belonging to Colonel the Hon. D.

Pennant, which has been worked upwards of 70 years, and employs at the present time

2600 men, producing an estimated profit of upwards of £20,000 per annum.

On the same vein or bed, to the south-west, is the quarry of Thomas Asheton Smith,

Esq., employing 1500 men, and yielding an estimated profit of £50,000 per annum.

These quarries were commenced by an outlay of a few thousand pounds.

The vein or bed of the Coyntor estate is the same, both in width and quality, as that

of Colonel Pennant's and Mr. Asheton Smith's; this is shown by a small adjoining

quarry, the Pantradrain, worked to the depth of 160 ft., within 20 yards of the boundary

of this company's quarry, and by shafts sunk in various parts of the set.

The Bangor and Coyntor Quarries has not yet been worked, except upon trial, but a

quarrying is chiefly done by piece-work. The wages paid at the adjoining quarries are

under 30s. per thousand: the cartage to the port is 9s. per thousand, or 3s. per ton; is the

present price of slate, taking the average of Duchesses, Countesses, and Ladies, is about

85s. per thousand, leaving a gross profit, after the quarry has been well opened, of 50 per

cent. on the labour expended, and a net profit of upwards of 30 per cent. The profit on

the principal quarries along this great bed exceeds that amount.

Such is the repute, and so great is the demand for Bangor slate, that, on an average,

throughout the year, from 50 to 60 vessels, of from 50 to 400 tons, lie at the port of

Bangor waiting their turn for cargo from the Bangor slate quarries.

During the late panic, when the price of almost every article of commerce was reduced

20 per cent., the list price of the principal slate quarries suffered no diminution.

A piece of freehold land, adjoining the Menai Strait at Bangor, has been purchased, on

which a wharf, for shipping the slate, may be constructed at a moderate expense.

The capital of the company will be £50,000, not more than £6 per share, or £30,000,

will be called up within the first 12 months, which sum is deemed sufficient to cover the

purchase money and all other outlays, and to put the quarries into full operation.

Applications for shares, plans, and shares, to be made to Messrs. Foster, brothers,

25, Tokenhouse-yard; Mr. J. M. O'Brien, broker; or to Mr. Nicholson,

at the office of the company, 57, Old Broad-street, London.

## CORNWALL NEW MINING COMPANY.

Capital £100,000, divided into 20,000 shares, of £5 each.

(With power to be increased.)

To be incorporated, in pursuance of the statute of 7 and 8 Vic., cap. 110—by which the

responsibility of each shareholder is limited.

Deposit 30s. per share.

Not to be Paid until the Company is completely Registered and Incorporated.

THE CORNWALL NEW MINING COMPANY is ESTABLISHED TO WORK A SERIES

OF TIN AND COPPER MINES, chiefly in the district of ST. IVES, which has hitherto

afforded a large profit on its return of ore than any other part of the country.

In pursuance of this plan, five of this description have been already selected—viz.,

Georgia Tin Mines, Treworthe Tin and Copper Mine, Bray Tin and Copper Mine, Tre-

varno Tin and Copper Mine, and Wheal Squire Tin and Copper Mine, with whose

committees have been enabled to make such advantageous arrangements, as to enable

them to work one or more with even a small portion of the proposed capital.

These mines are not only known to contain mineral ores of immense value, but the

workings are already so far advanced, that the mines ascertained and reached must

produce early and large returns; and, in addition to the above, there are others which the

committee have secured on sufficient public support being obtained.

With a view of inducing the public generally to avail themselves of such a beneficial

employment of their capital, the committee have made the shares £5, and of which only

£3 10s. is to be paid within 18 months—limiting further calls to the control of the

subscribers themselves, and to be made only when a dividend shall have been declared.

Applications for shares to be made, in the usual form, at the offices of the company,

17, Essex-street, Strand; and to the following brokers and agents, of whom detailed

prospectuses may be obtained:—Messrs. G. and T. Irvine, Liverpool; Messrs. Cardwell and

Sons, Manchester; Messrs. J. Scott and Son, Birmingham; Messrs. Rhodes and Hayes,

Leeds; Messrs. Baily and Co., Hull; Mr. Joseph Clarke, Jan., Southampton; Mr. Cline,

Clay, Halifax; Messrs. Williams and Charles Skardon, Plymouth; Messrs. W. Moore and

Co., Huddersfield; Mr. Thomas Dewhurst, Bradford; Mr. Henry Vatcher, Exeter; Mr.

Charles Dodsworth, York; Mr. W. F. Collier, Brigham; F. Crowe, Great Yarmouth; Mr.

Robinson Vincent, Dartmouth; Messrs. Edward Morgan and Co., Norwich; Messrs. Ro-

binson Cruise and Son, King's Lynn.—Prospectuses can also be had at the office of the

*Mining Journal*, 28, Fleet-street, London.

GEORGE LOCKWOOD, Secretary.

Office, 17, Essex-street, Strand.

## EAST BIRCH TOR MINING COMPANY.

NOW WORKING ON THE COST-BOOK SYSTEM.

In 3500 shares, at £3 per share.

LOCAL MANAGERS—Capt. Thomas Moyle.

PURSER—Mr. Thomas Balle, Exeter.

BANKERS—Roberts, Curtis, & Co., London; Milford, Snow, & Co., City Bank, Exeter.

SOLICITOR—Mr. Ambrose Clare, 5, Sile-lane, Bucklersbury, London.

SECRETARY—Capt. William Henry Smith, R.N., 1, Copthall Chambers, Throgmorton-

street, London.

The East Birch Tor Tin Mine is held by this company for an unlimited term of years,

provided four miners be kept at work on the mine, at the very low dose of 1-25th.

It is situated in the parish of North Ewrey, 6 miles west of Moreton, 18 miles west of

Exeter, 15 miles north-west of Ashburton and Newton, 14 miles east of Tavistock, and

20 north-west of Plymouth, in the county of Devon.

The mine is worked on the Cost-Book System, by which each shareholder is responsible

only for the amount of shares he holds, and whereby he is at liberty to withdraw him-

self at any time, and demand his portion of the value of the mine, on giving notice to the

## PATENT ALKALI COMPANY'S IRON PAINT.—This

PAINT, now first offered to the public, is the PRODUCT of a PATENT PRO-

CESS, and possesses VALUABLE and PECULIAR QUALITIES, not otherwise attain-

able. Its colour is a purple-brown—it is perfectly innocuous—is far more durable than

lead paint, and two coats are fully equal to three of any other paint. A single coat will

be sufficient to demonstrate this. It dries rapidly, and its durability is very great.

From its chemical composition, it is especially, and above all other paints, adapted

covering iron; also wood, and stucco, or brick walls. The peculiar oxidation of the

base of this paint makes it impossible that further change should take place in its com-

position. Its identity with iron secures it from galvanic action, so injurious to the dura-

bility of lead paints on iron work. It has been exposed on shipping to the action of sea-

water, and the sulphuretted hydrogen, so prevalent in sea-ports and tidal harbours, for

three years, without change.

Its cheapness and strength render it admirably adapted for iron railings, farm build-

ings, and shipping. It will also cover creosoted timber. Price, by the ton, £20, delivered

in London. All orders to be addressed to the office of the company, 50, Fenchurch-